ORDER NO. AD9304104C8

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

MASH※ multi-stage noise shaping

Compact Disc Changer

SL-PD647

Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

NEW MECHANISM SERIES
(RAE0301: Type A/RAE0302: Type B)

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	92 dB
S/N	100 dB
Total harmonic distortion	0.007% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH (1 bit)
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

■ Pickup

Wavelength	780 nm

■ General

Power consumption	15 W
Power supply	
For (E, GN) areas.:	AC 50/60 Hz, 230–240 V
For (GC) area:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Dimensions (W × H × D)	430 × 130 × 401 mm
Weight	5.0 kg

Note:

Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

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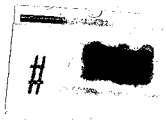
Technics



■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output radiation power from pickup: 100μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

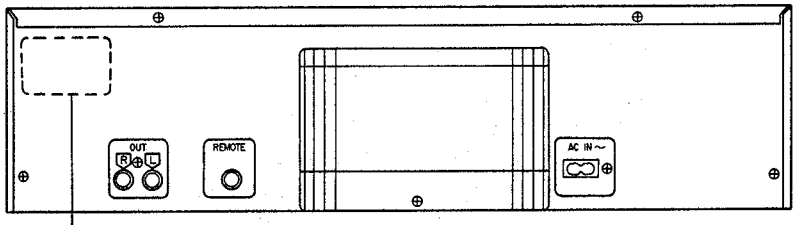
ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

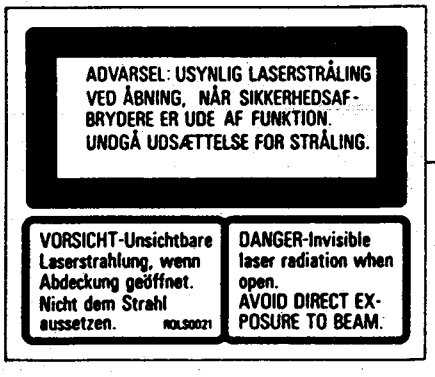
ADVARSEL: I dette a apparat anvendes laser.

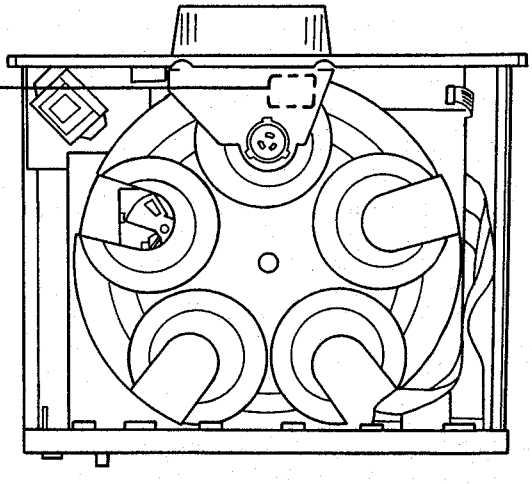


SQWD7

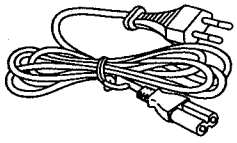
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

RQLS0021

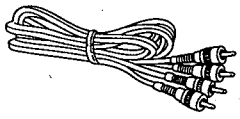

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet. Nicht dem Strahl aussetzen.
RQLS0021
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.



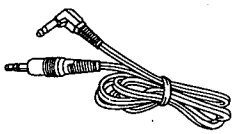
■ ACCESSORIES (included)



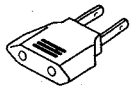
AC power supply cord..... 1 pc.
[RJA0019-2K (E, GC)
SJA173 (GN)]



Stereo connection cable..... 1 pc.
(SJP2249-3)



Remote control cable..... 1 pc.
(SJP2257T)



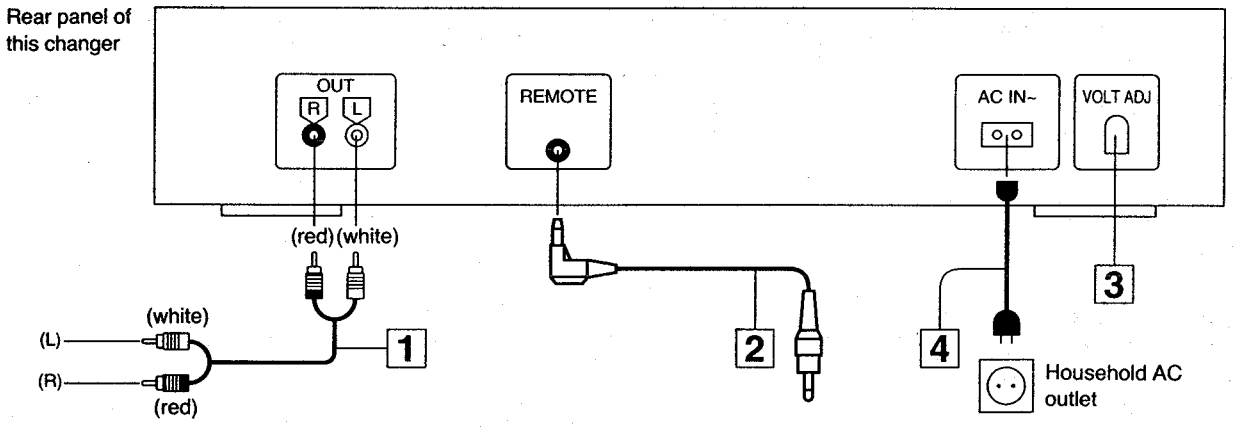
Power plug adaptor... 1 pc.
(SJP5213-2)
For (GC) area.

■ CONNECTIONS

Before connecting the changer to your audio system, be sure that the power of the changer and all other system components are turned off.

Note:

The configuration of the AC outlet and AC power supply cord differs according to area.



1 Connect the stereo connection cable (included) to CD or AUX terminals of the amplifier or the receiver.

2 To operate with the remote control, connect the remote control cable (included) to the REMOTE CONTROL OUT terminal of Technics component.

> The operations such as play, stop, skip etc. can be operated by remote control included with Technics receiver or the component system. For details, refer to the operating instructions of the receiver or the system to be used.

For (GC) area.

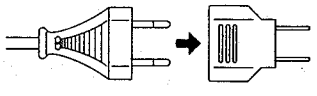
3 Set the voltage selector (VOLT ADJ) to the voltage setting for the area in which the unit will be used.

- Use a minus (−) screwdriver.
- Note that this unit will be seriously damaged if this setting is not made correctly.
- If the power supply in your area is 117 V or 120 V, set to the "127 V" position.

4 Connect the power supply cord (included) to the household AC outlet or to AC OUTLET of Technics component.

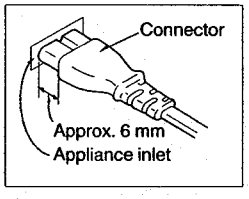
For (GC) area.

If the power plug will not fit your socket, use the power plug adaptor (included).

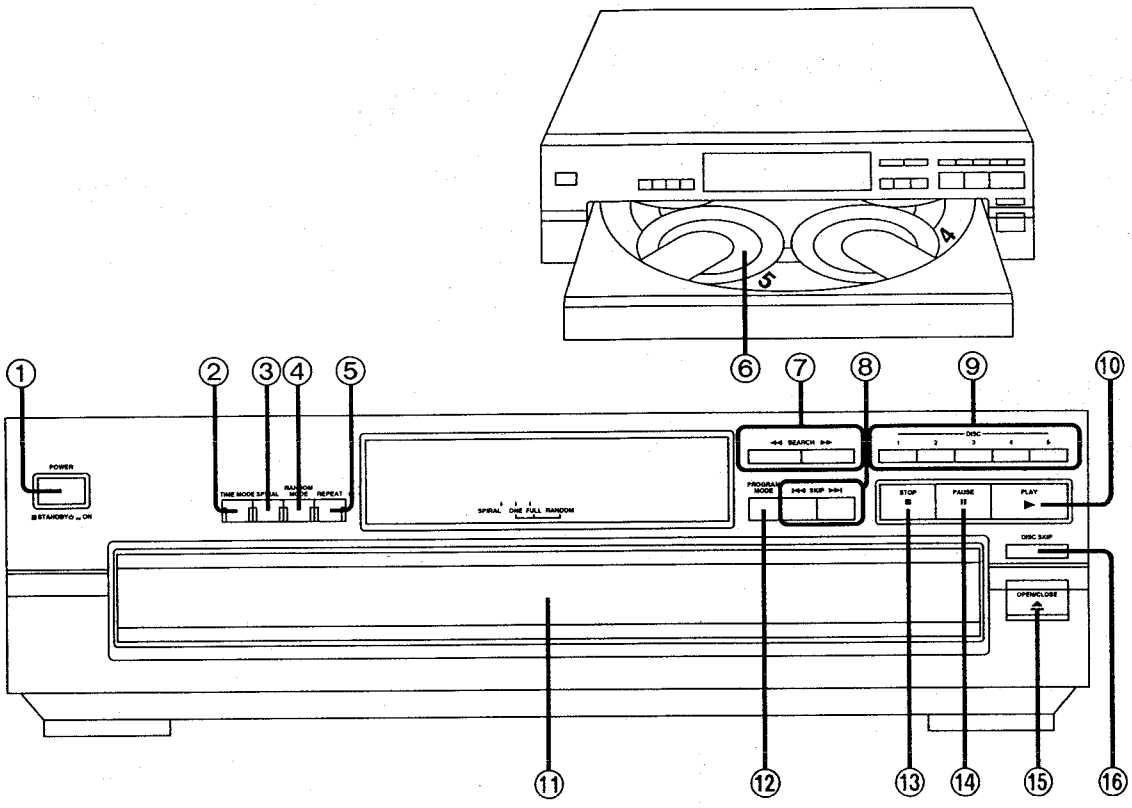


Insertion of Connector

Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing.
However there is no problem using the unit.



■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power "STANDBY ⏻ /ON" switch (POWER, ▙ STANDBY ⏻ ▂ ON)
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

② Time mode select button (TIME MODE)
Use to select the desired time mode. Each time you press the button, the display information will change as follows.
1. Track number and its elapsed play time of the current track.
2. Total remaining time on the disc.
3. Track number and remaining time of the current track.
4. Total elapsed play time on the disc.

③ Spiral button (SPIRAL)
Press to play the first tracks on all the loaded discs in sequence, followed by the second tracks on all the discs, and so on.

④ Random mode button (RANDOM MODE)
The mode changes as follows each time the button is pressed.

↱ Sequential → One disc random → Full random ↰

⑤ Repeat button (REPEAT)
Press to repeat tracks.

⑥ Disc trays (1–5)
You can load up to five discs, one disc per one tray.

⑦ Search buttons (◀◀ SEARCH ▶▶)
Press to move forward or backward through the tracks on the disc.

⑧ Skip buttons (I◀◀SKIP▶▶I)
Use to skip to the beginning of the track.

⑨ Disc buttons (DISC 1–5)
Use to select desired disc.

⑩ Play button (▶ PLAY)

⑪ Loading drawer
You can load and unload discs when this drawer is open.

⑫ Program mode button (PROGRAM MODE)
The mode changes as follows each time the button is pressed.

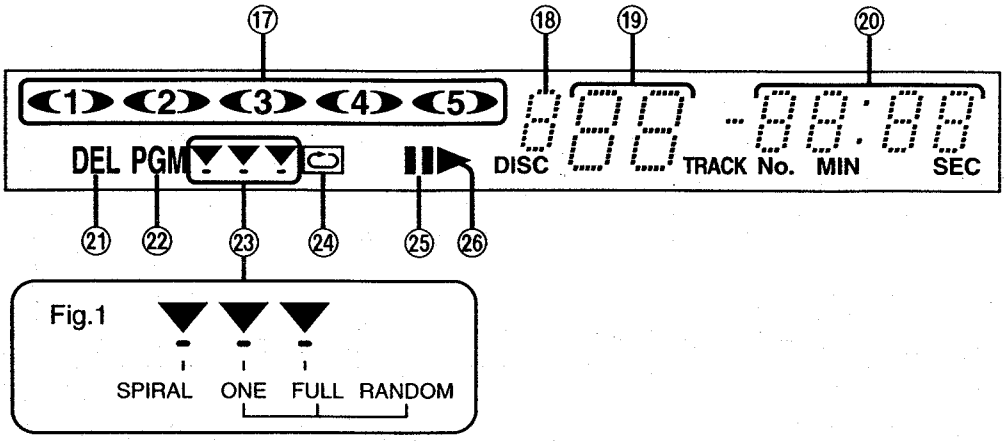
↱ Sequential → Program → Delete ↰

⑬ Stop button (■ STOP)

⑭ Pause button (❚❚ PAUSE)

⑮ Loading drawer open/close button (▲ OPEN/CLOSE)

⑯ Disc skip button (DISC SKIP)
Use to rotate the disc tray.



Display section

⑰ Disc indicators (1 ~ 5)
The indicator corresponding to the playing disc flashes.
In the program play mode, programmed disc indicators will illuminate. In the delete play mode, disc indicators to be deleted will go out.

⑱ Disc number display
Shows the number (1–5) of disc.

⑲ Track number display
Shows the number (up to 99) of track.

⑳ Time/program sequence display
Shows the elapsed playing time of the track in play.
Also shows the program sequence in the program play mode, and the sequence you entered in the delete play mode.

㉑ Delete play indicator (DEL)
Lights in the delete play mode.

㉒ Program play indicator (PGM)
Lights in the program play mode.

㉓ Play mode indicators (▼▼▼) (Fig. 1)
Each indicator points to the following play modes:
SPIRAL: Spiral play
ONE: One disc random play
FULL: Full random play

㉔ Repeat indicator (⟲)
Lights when the repeat function is activated.

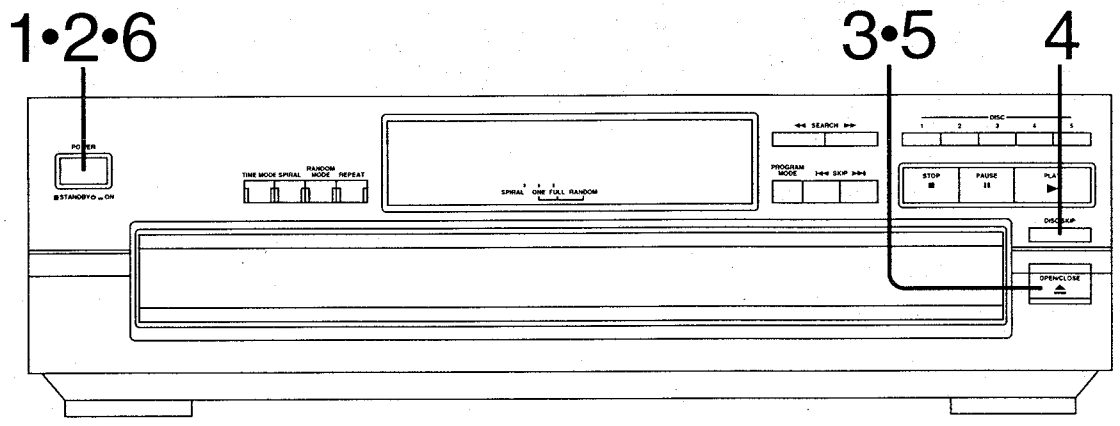
㉕ Pause indicator (❚❚)
Lights in the pause mode.

㉖ Play indicator (▶)
Lights in the play mode.

■ BEFORE MOVING

CAUTION:

Before moving this changer to another location, be sure that no discs were left in the changer and that the power was not switched to the standby condition while in the play mode.
Failure to do so will expose the compact discs and the changer to the risk of severe damage.



1 **Press POWER to switch to the standby condition.**

2 **Press POWER to switch on the power.**

3 **Press OPEN/CLOSE to open the loading drawer.**

4 **Press DISC SKIP to rotate the disc trays and remove the discs from all disc trays.**

5 **Press OPEN/CLOSE to close the loading drawer.**

6 **Press POWER to switch to the standby condition.**

If you have pressed a wrong button by mistake, return to step 1.

The optical pickup will be automatically released when using the changer again.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

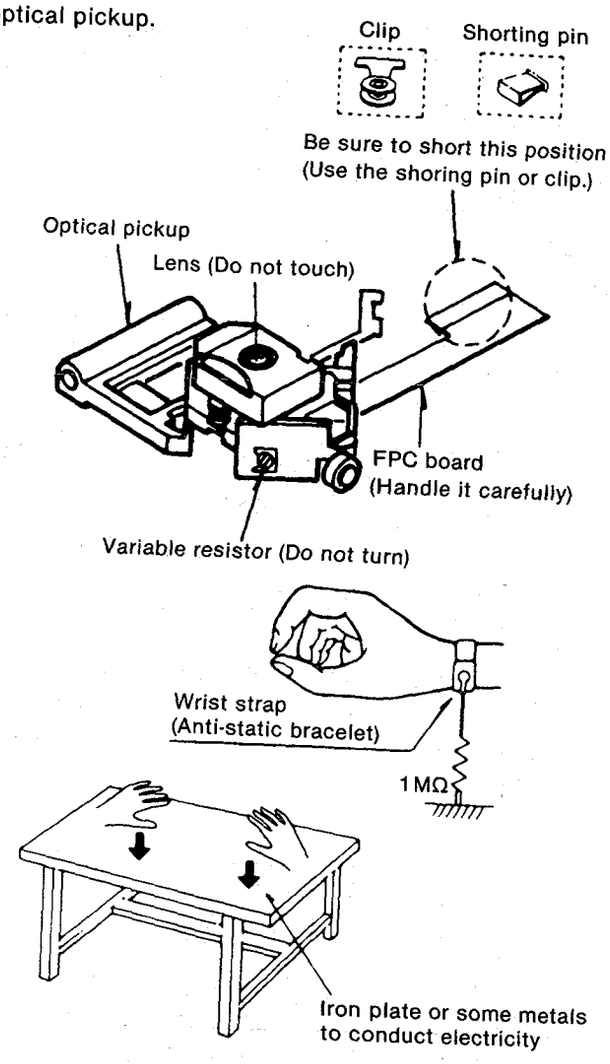
1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table gounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

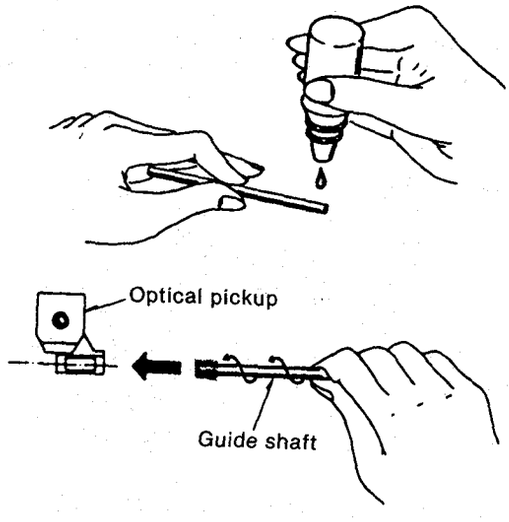


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil.
One application (one shaft) uses 0.05ml of oil.

How to Use

(1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
(2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
(3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
(4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.

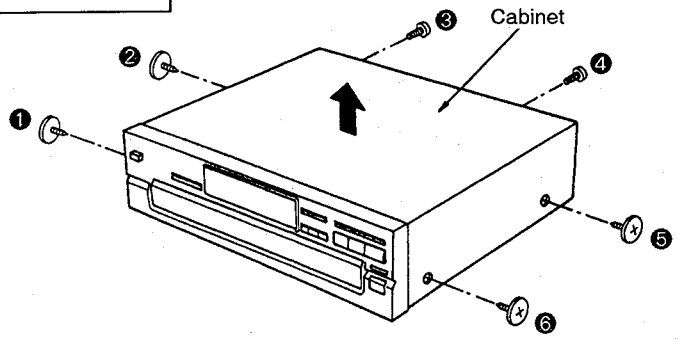


■ DISASSEMBLY INSTRUCTIONS

Warning: This product uses a laser diode. Refer to caution statements on page 2.

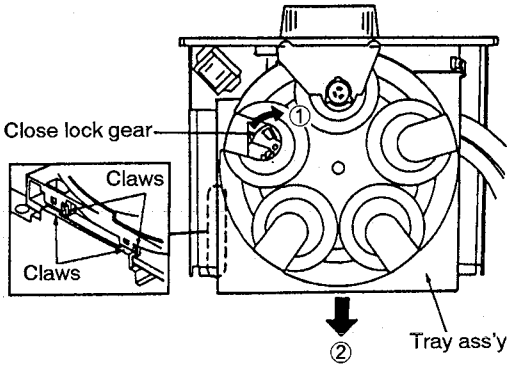
ACHTUNG: • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref.No. 1	Removal of the cabinet
Procedure 1	

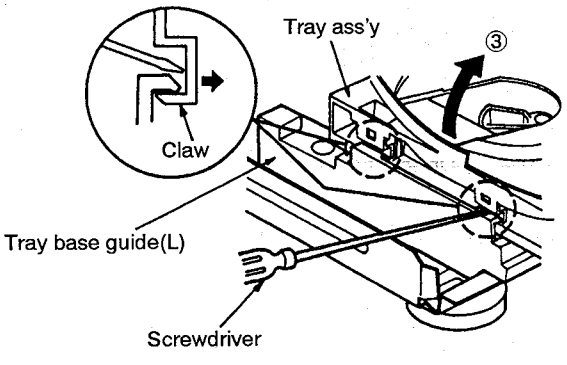


1. Remove the 6 screws(❶~❻).
2. Remove the cabinet in the direction of arrow.

Ref.No. 3	Removal of the tray ass'y
Procedure 1→2→3	**Note:** Be sure the close position to remove the tray ass'y.

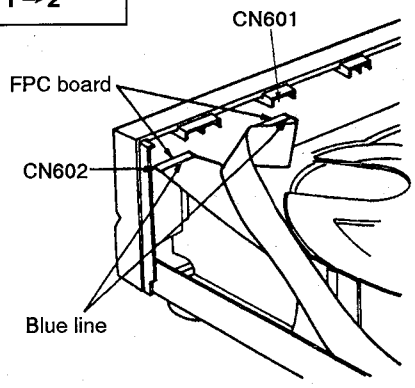


1. Keep the close lock gear pressed in the direction of arrow ① and move the tray ass'y in the direction of arrow ②.
2. Fit the claws of the tray ass'y in the claws of the tray base guide (L).



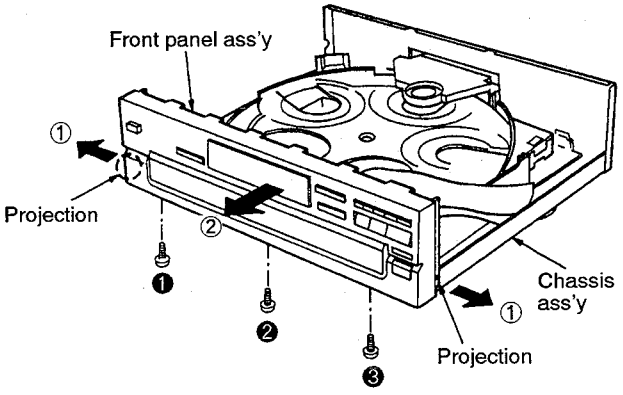
3. Remove the tray ass'y in the direction of arrow ③ by pressing the claw of the tray ass'y with a screw driver or another suitable object.

Ref.No. 2	Removal of the front panel ass'y
Procedure 1→2	

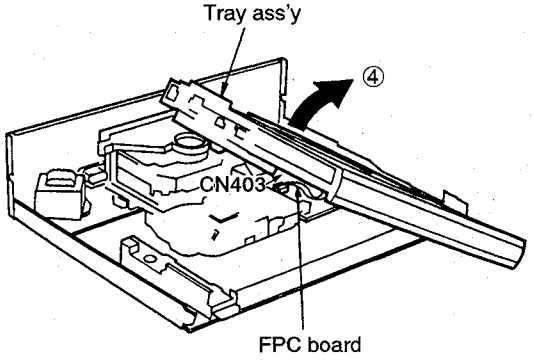


■ **Note on installation**
Connect the FPC board with the blue line upward.

1. Pull out the FPC board.



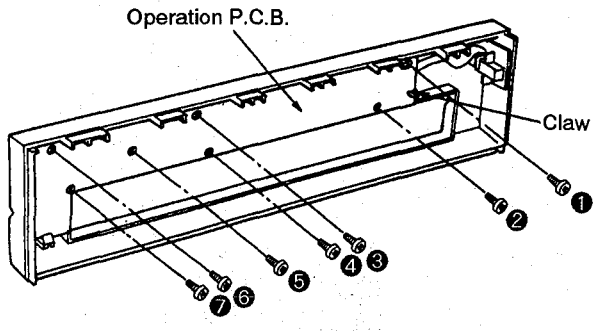
2. Remove the 3 screws(❶~❸).
3. Pull the front panel ass'y in both directions of arrow ① to unlock it from the projection of the chassis ass'y.
4. Remove the front panel ass'y in the direction of arrow ②.



4. Raise the left side of the tray ass'y in the direction of arrow ④ and remove the claw on the right side.
5. Pull out the FPC board.

Ref.No. 4	Removal of the operation P.C.B.

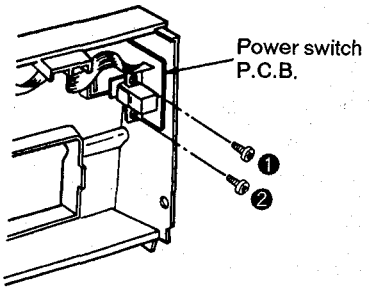
Procedure 1→2→4



1. Remove the 7 screws(❶~❼).
2. Release the 1 claw.

Ref.No. 5	Removal of the power switch P.C.B.

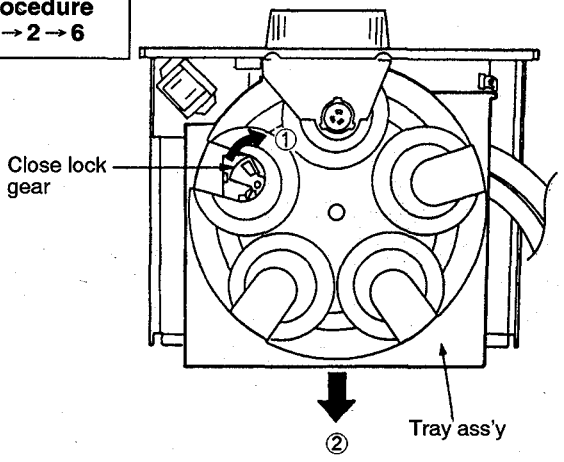
Procedure 1→2→5



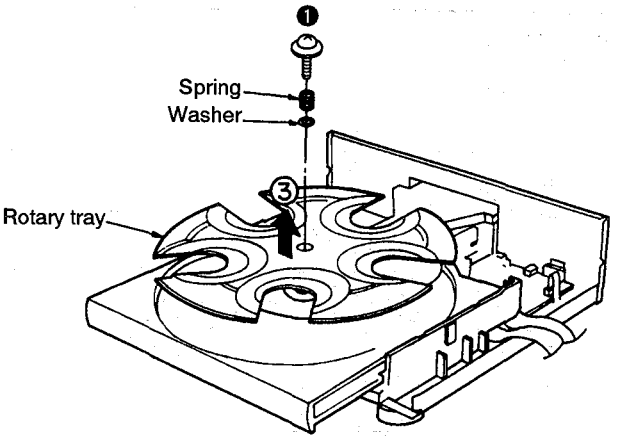
• Remove the 2 screws(❶, ❷).

Ref.No. 6	Removal of the rotary tray

Procedure 1→2→6



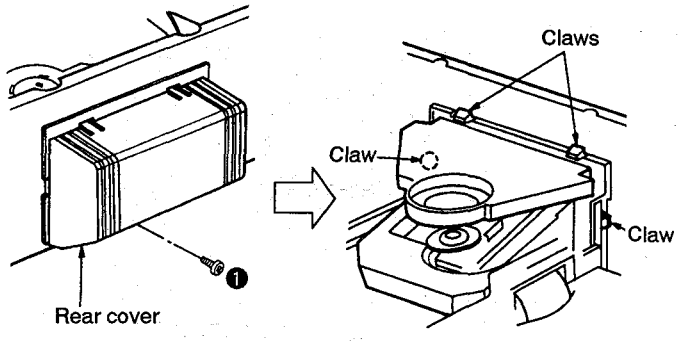
1. Keep the close lock gear pressed in the direction of arrow ① and move the tray ass'y in the direction of arrow ②.



2. Remove the 1 screw(❶).
3. Remove the spring and washer.
4. Remove the rotary tray in the direction of arrow ③.

Ref.No. 7	Removal of the rear cover

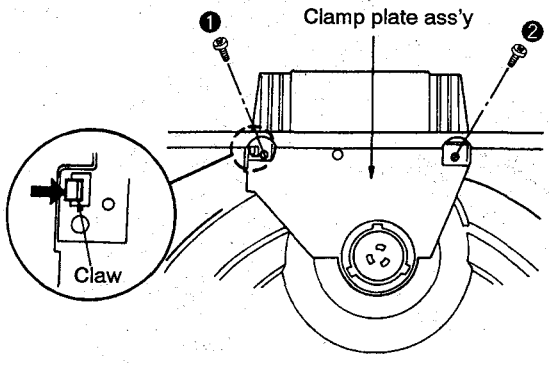
Procedure 1→7



1. Remove the 1 screw(❶).
2. Release the 4 claws.

Ref.No. 8	Removal of the clamp plate ass'y

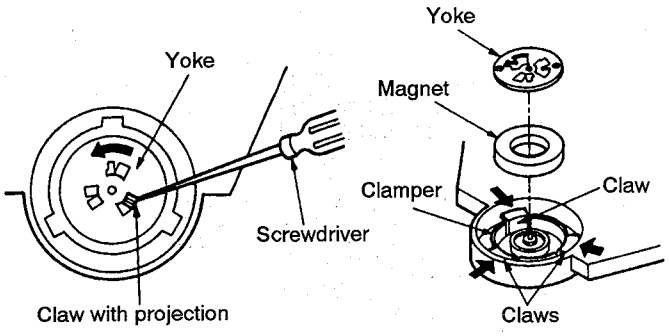
Procedure 1→8



1. Remove the 2 screws(❶, ❷).
2. Release the 1 claw.

Ref.No. 9	Removal of the clamper ass'y (yoke, magnet and clamper)

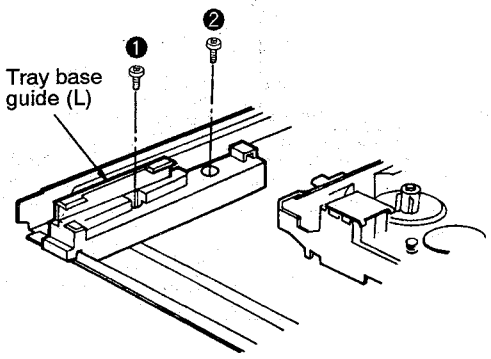
Procedure 1→8→9



1. While lifting the claw with a screwdriver, rotate yoke in the direction of arrow and remove the yoke and magnet.
2. Release the 3 claws of the clamper.

Ref.No. 11	Removal of the tray base guide (L)

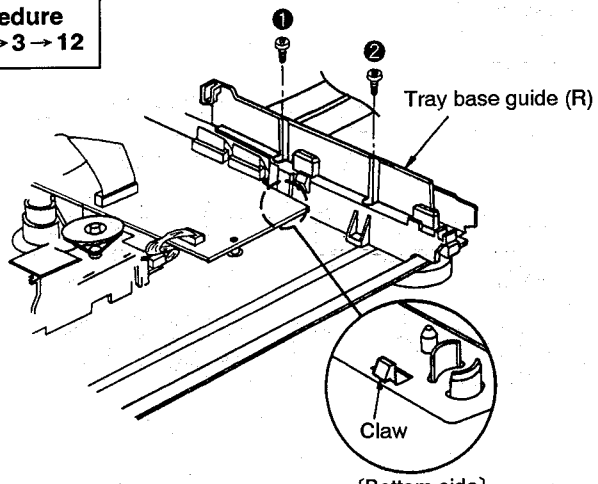
Procedure 1→2→3→11



• Remove the 2 screws(❶, ❷).

Ref.No. 12	Removal of the tray base guide (R)

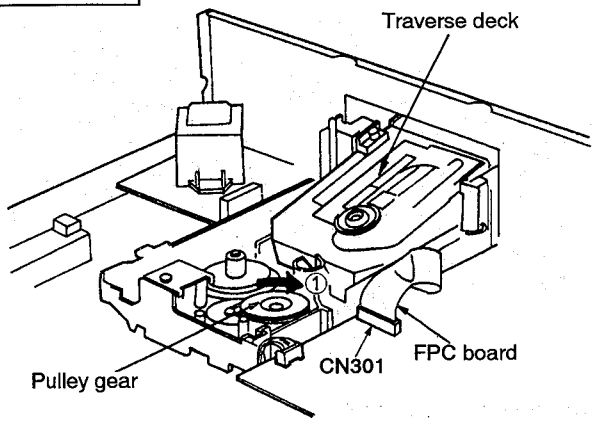
Procedure 1→2→3→12



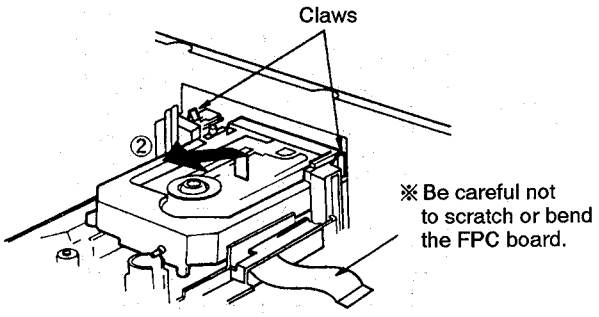
1. Remove the 2 screws(❶, ❷).
2. Release the 1 claw.

Ref.No. 10	Removal of the traverse deck

Procedure 1→2→3→7→8→10



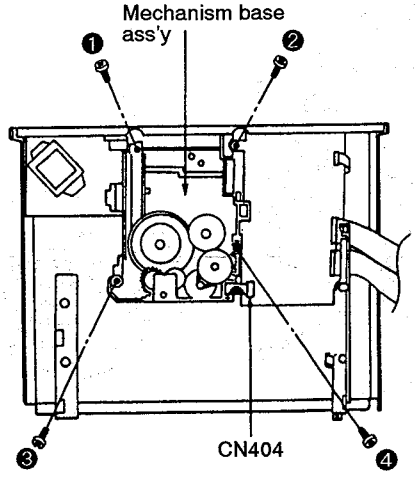
1. Rotate the pulley gear in the direction of arrow ① until the traverse deck comes up.
2. Pull out the FPC board (CN301).



3. Release the 2 claws.
4. Remove the traverse deck in the direction of arrow ②.

Ref.No. 13	Removal of the mechanism base ass'y

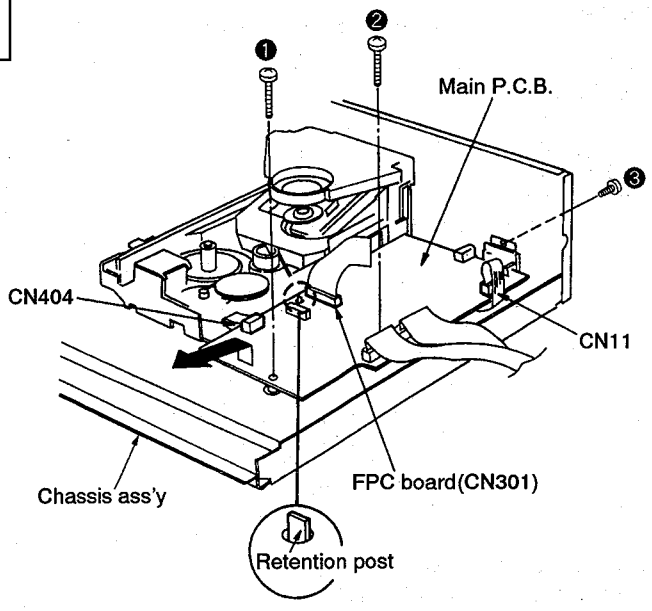
Procedure 1→2→3→7→8→10→13



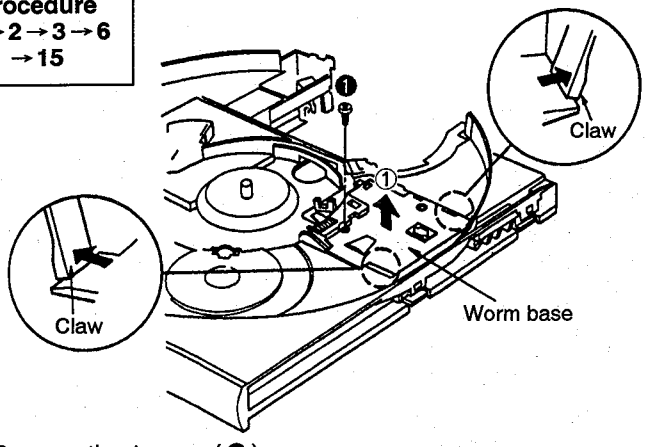
1. Remove the 1 flat cable(CN404).
2. Remove the 4 screws(❶~❹).

Ref.No. 14	Removal of the main P.C.B.
Procedure 1→2→3→12→14	

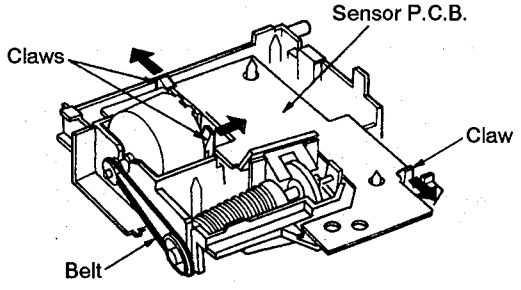
1. Remove the 3 screws(❶~❸).
2. Lift the main P.C.B. off the retention post on the chassis ass'y.
3. Remove the 2 flat cable(CN11, CN404).
4. Pull out the FPC board(CN301).
5. Remove the main P.C.B. in the direction of arrow.



Ref.No. 15	Removal of the worm base and sensor P.C.B.
Procedure 1→2→3→6→15	

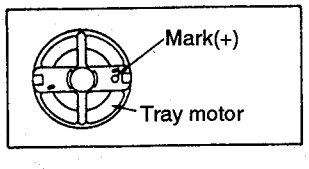


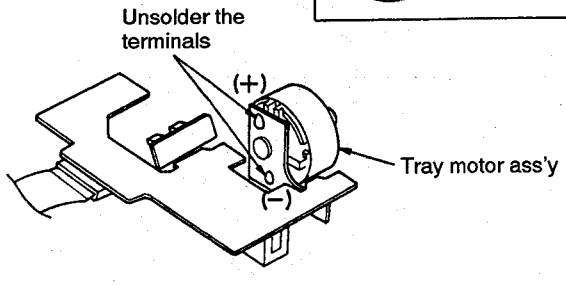
1. Remove the 1 screw(❶).
2. Release the 2 claws and then remove the worm base in the direction of arrow①.



3. Remove the belt.
4. Release the 3 claws.

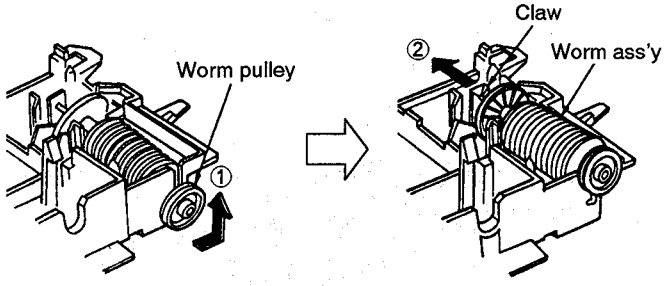
Ref.No. 16	Removal of the tray motor ass'y
Procedure 1→2→3→6→15→16	





• Unsolder the terminals of the tray motor ass'y.

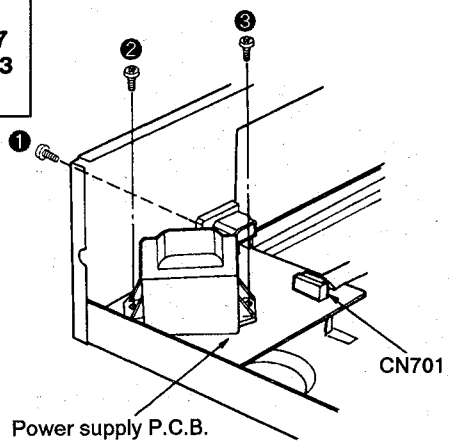
Ref.No. 17	Removal of the worm ass'y
Procedure 1→2→3→6→15→17	



1. Raise the worm pulley in the direction of arrow①.
2. Remove the worm ass'y by pressing the claw in the direction of arrow②.

Ref.No. 18	Removal of the power supply P.C.B.

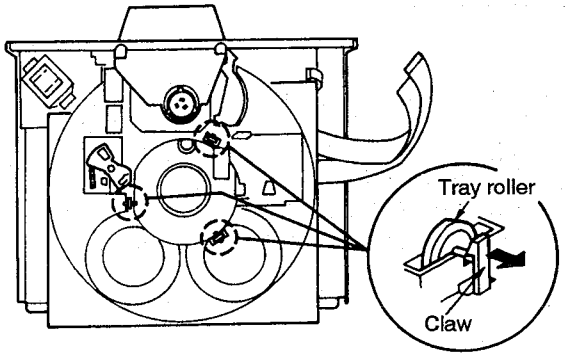
Procedure
1 → 2 → 3 → 7 → 8 → 10 → 13 → 18



1. Remove the 1 flat cable(CN701).
2. Remove the 3 screws(❶~❸).

Ref.No. 19	Removal of the tray roller

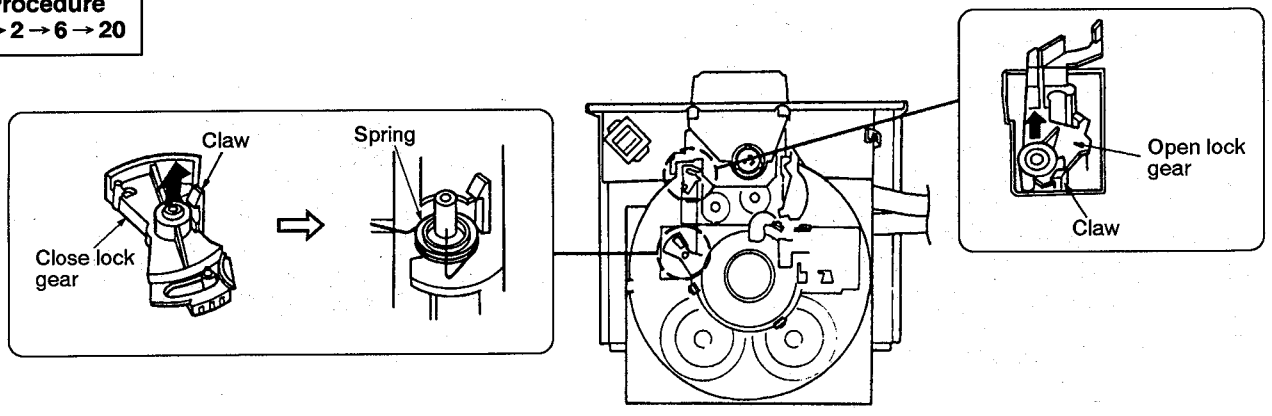
Procedure
1 → 2 → 6 → 19



- Release the claw in the direction of arrow.

Ref.No. 20	Removal of the close lock gear and open lock gear

Procedure
1 → 2 → 6 → 20

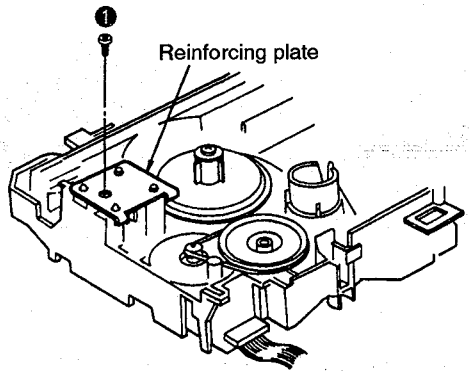


■ Close lock gear
1. Release the claw and then remove the close lock gear in the direction of arrow.
2. Remove the spring.

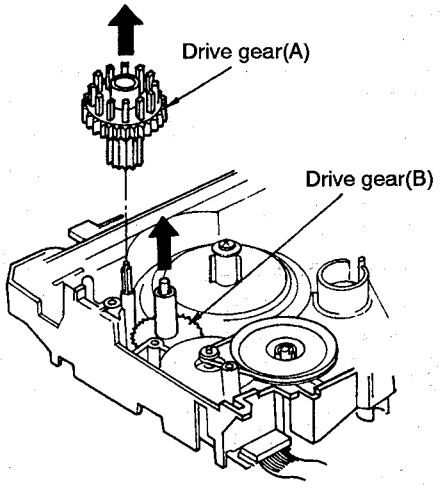
■ Open lock gear
- Release the claw and then remove the open lock gear in the direction of arrow.

Ref.No. 21	Removal of the drive gear(A) and drive gear(B)

Procedure
1 → 2 → 3 → 21



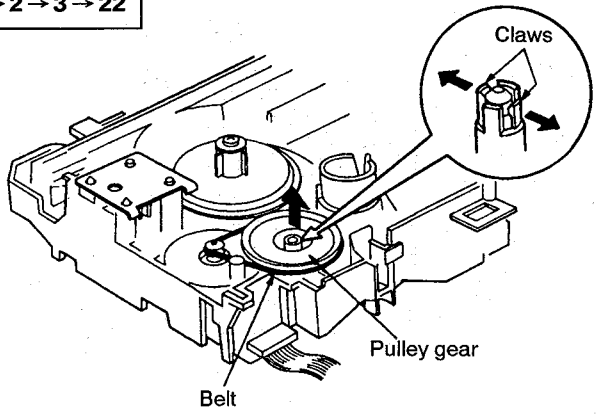
1. Remove the 1 screw(❶).
2. Remove the reinforcing plate.



3. Remove the drive gear(A) and drive gear(B).

Ref.No. 22	Removal of the pulley gear

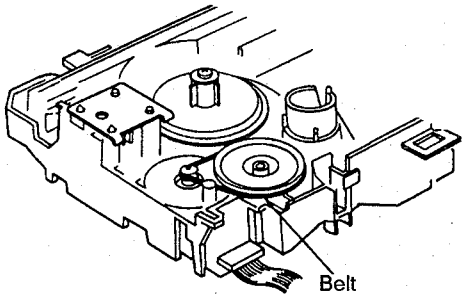
Procedure
1 → 2 → 3 → 22



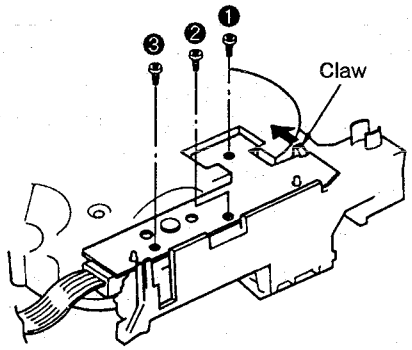
1. Remove the belt.
2. Release the 2 claws and then remove the pulley gear in the direction of arrow.

Ref.No. 24	Removal of the loading motor P.C.B.

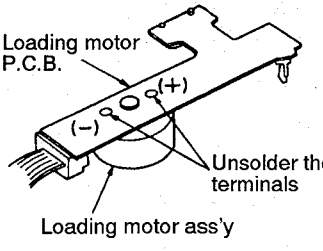
Procedure
1 → 2 → 3 → 7 → 8 → 10 → 13 → 24

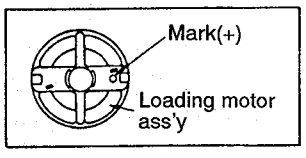


1. Remove the belt.



2. Remove the 3 screws(❶ ~ ❸).
3. Release the 1 claw.

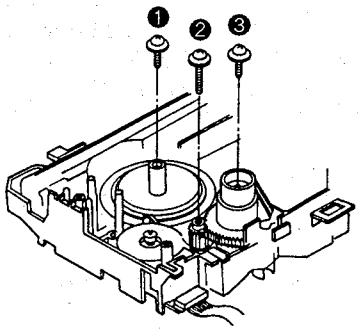




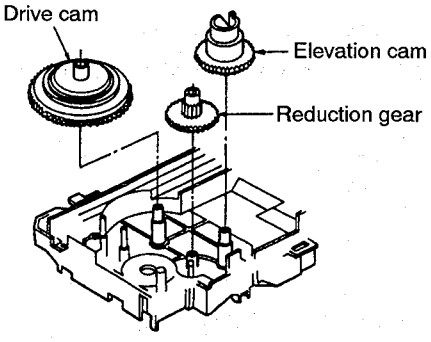
4. Unsolder the terminals of the loading motor ass'y.

Ref.No. 23	Removal of the drive cam, elevation cam and reduction gear

Procedure
1 → 2 → 3 → 21 → 22 → 23



1. Remove the 3 screws(❶ ~ ❸).

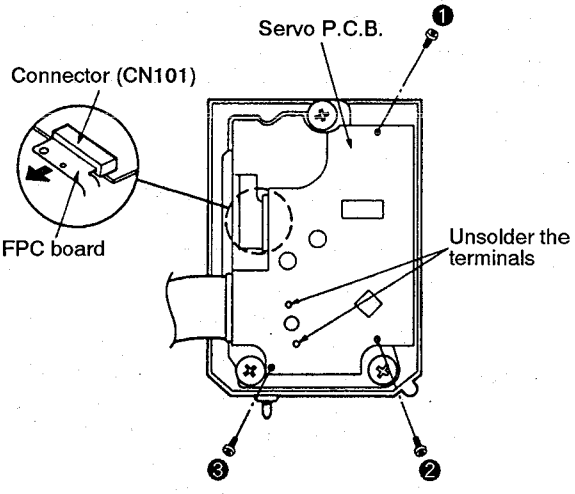


2. Remove the drive cam, elevation cam and reduction gear.

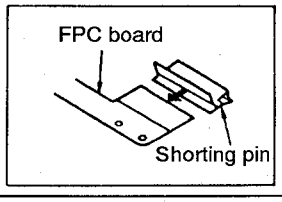
Ref.No. 25	Removal of the servo P.C.B.

Procedure
1 → 2 → 3 → 7 → 8 → 10 → 25

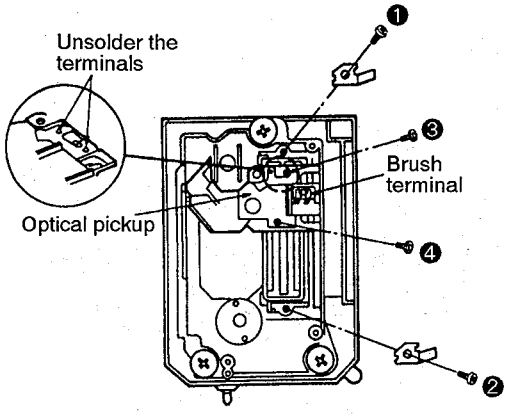
1. Remove the 3 screws(❶ ~ ❸).
2. Unsolder the 2 terminals of spindle motor.
3. Remove the FPC board from the optical pickup.



Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.



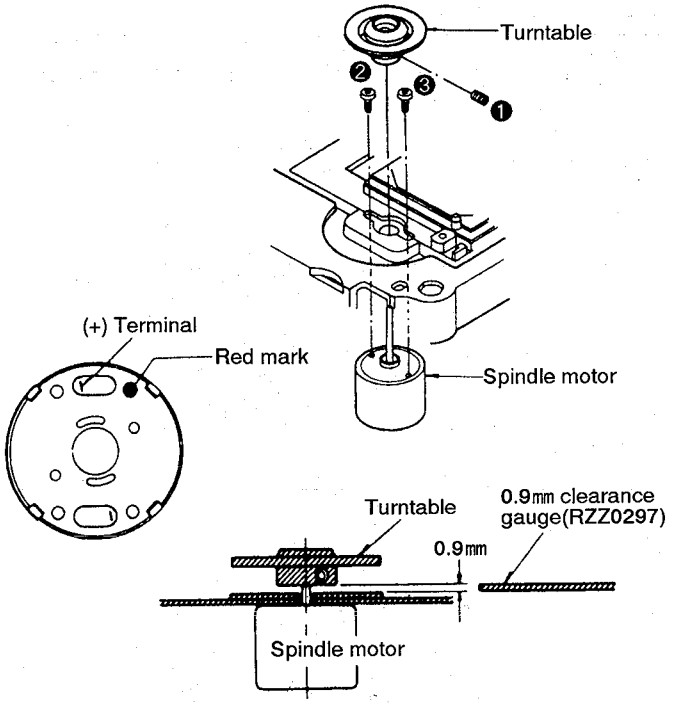
Ref.No. 26	Removal of the optical pickup
Procedure 1→2→3→7 →8→10→25 →26	Refer to handling precautions for optical pickup and instructions for traverse oil (See page 7).



1. Remove the 2 screws(❶, ❷).
2. Unsolder the 2 terminals and the 2 screws(❸, ❹).

Caution: Take care not to touch the brush terminal.

Ref.No. 27	Removal of the spindle motor
Procedure 1→2→3→7 →8→10→25 →27	



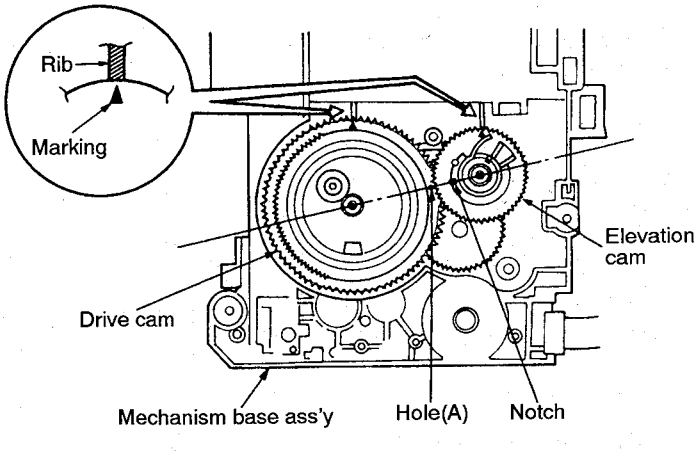
1. Loosen the 1 screw(❶) by using a 1.27mm allen wrench and remove the turntable.
2. Remove the 2 screws(❷, ❸).

Caution:
1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+)terminal of the spindle motor is indicated by the red mark.

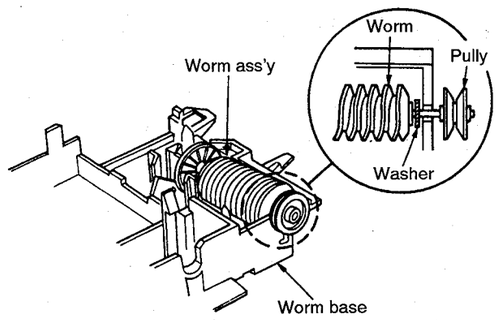
Adjustment of turntable height
1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown in the figure.
2. Tighten the turntable set-screw by using a 1.27mm allen wrench.

Caution:
Refer to turntable height adjustment (See page 25).

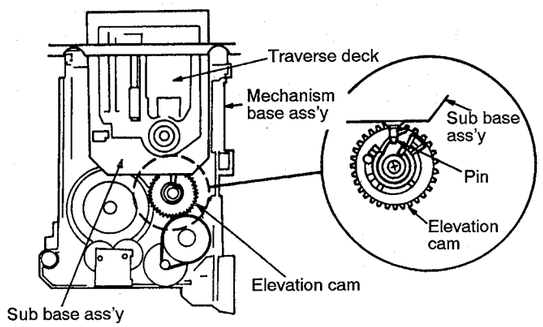
- **Installation of the elevation cam and drive cam**
  1. Align the drive cam, the marking (▲) on the elevation cam, and the rib on the mechanism base ass'y.
  2. Check that hole(A) on the drive cam and the notch on the elevation cam are aligned in a straight line.



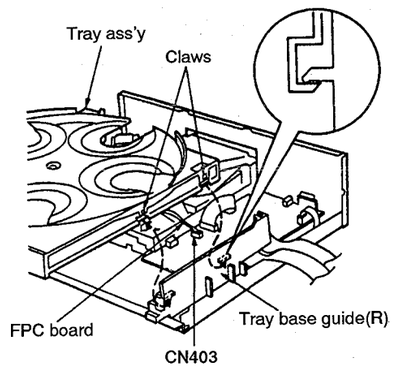
● **Installation of the worm ass'y**
When installing the worm ass'y onto the worm base, move the washer located between the worm and pulley next to the worm.



● **Installation of the traverse deck**
1. Position the elevation cam as shown in the figure on the right.
2. When the traverse deck is mounted on the mechanism base ass'y, check that the pin of the sub base ass'y is positioned at the slanted part of the rib on the elevation cam.

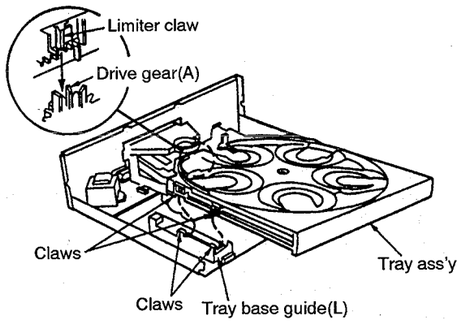


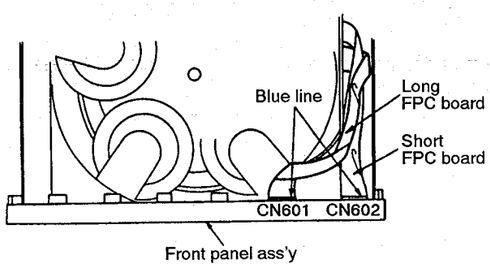
● **Installation of the tray ass'y**
1. Attach the FPC board to the connector(CN403).
2. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide(R).



● **Notes on the installation of the FPC board for the front panel ass'y**
1. With its blue line facing up, fully insert the FPC board until the foil is no longer exposed.
2. Insert the short FPC board first and then insert the long FPC board over it.

3. Fit the limiter claw on the tray ass'y between the teeth of the drive gear(A).
4. Align the claws on the left side of the tray ass'y with the claws on the tray base guide(L) and push the tray ass'y until the claws catch.
5. After installing the tray ass'y, check that it moves smoothly.





■ HOW TO CHECK THE MAIN AND SERVO P.C.B.

● **Check the main P.C.B.**

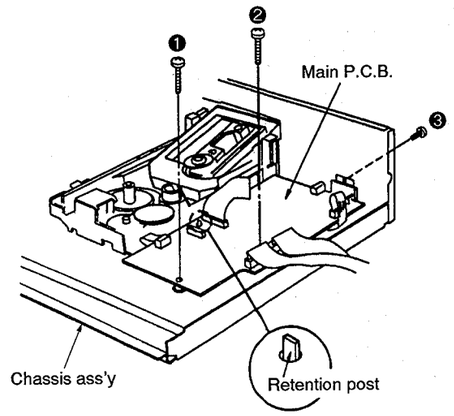


Fig. 1

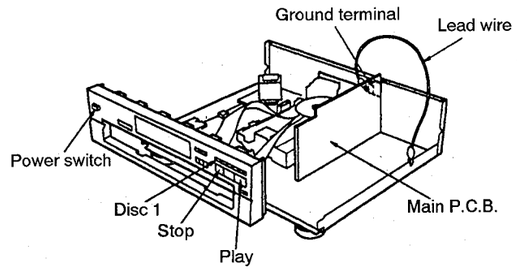


Fig. 3

● **Check the servo P.C.B.**
When checking the servo P.C.B., place the traverse deck sideways.
There are two ways(A) & (B) of securing the traverse deck as shown below.

(A) Securing the traverse deck to the chassis ass'y.

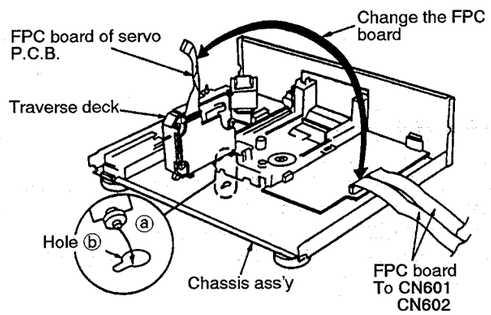


Fig. 4

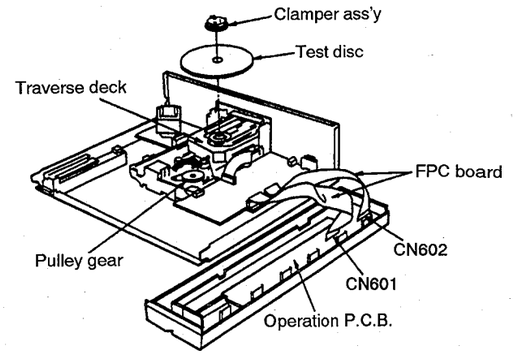


Fig. 2

1. Rotate the pulley gear in the direction of arrow until traverse deck comes up.
2. Place the test disc and secure it by using the clamper ass'y.
3. Connect the 2 FPC board(CN601, CN602) as shown in Fig. 2.
4. Remove the 3 screws(❶~❸) as shown in Fig. 1.
5. Lift the main P.C.B. off the retention post on the chassis ass'y.
6. Set up the main P.C.B.
7. Connect the main P.C.B. ground terminal (line out terminal) to the chassis ass'y with a lead wire.

How to play the disc

8. Set the unit in the test mode as follows:
(hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
9. Press the play key and play the test disc.
10. When checking the soldered surface of the main P.C.B., do as shown in Fig. 3.

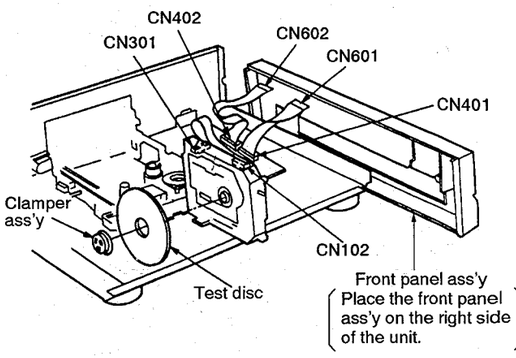


Fig. 5

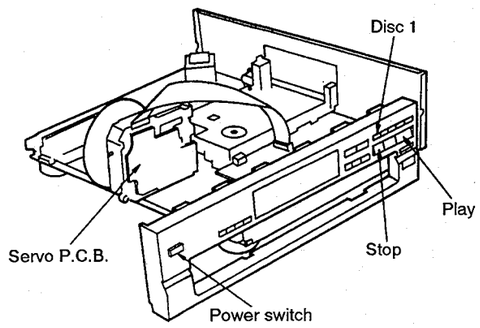


Fig. 6

1. Connect the FPC boards as shown in Fig. 5.
   (Between CN401 and CN601
   Between CN402 and CN602
   Between CN102 and CN301)
   Replace the FPC board for the servo P.C.B. (between CN102 and CN301) with the FPC board on the main P.C.B. (between CN401 and CN601 or between CN402 and CN602). (Reference the arrows in Fig. 4.)

(B) Securing the traverse deck to the mechanism base ass'y.

(The traverse deck cannot be secured unless the rear panel has been removed.)

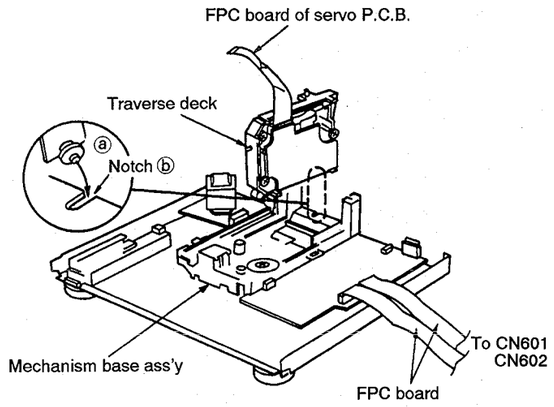


Fig. 7

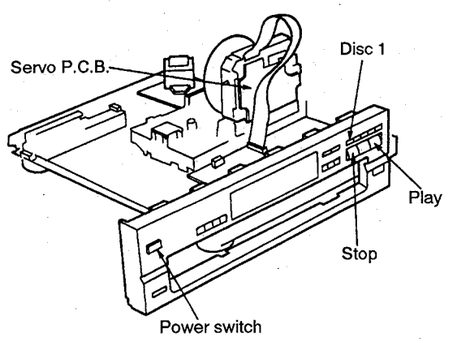


Fig. 9

Notes:
- The FPC board cannot be connected because it is too short when the traverse deck is secured sideways. Replace it with the long FPC board.
- After completing the check, restore the replaced FPC boards to their original positions.

2. Insert part ⓐ of the traverse deck into hole ⓑ of the chassis ass'y as shown in Fig. 4.

How to play the disc

3. Set the unit in the test mode as follows:
   (hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
4. Press the play key and play the test disc.
5. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 6.

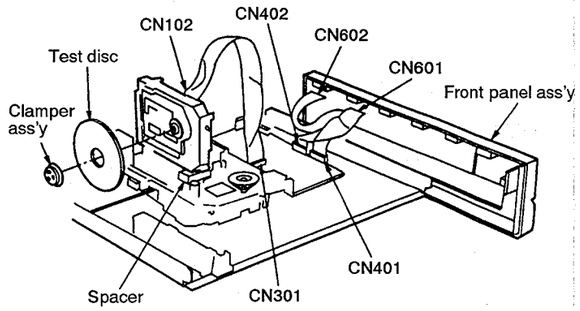


Fig. 8

1. Connect the FPC boards in the same manner as described in (A) above.
2. Insert part ⓐ of the traverse deck into notch ⓑ of the mechanism base ass'y as shown in Fig. 7.
3. Install the spacer so that the traverse deck is horizontal as shown in Fig. 8.

How to play the disc

4. Set the unit in the test mode as follows:
   (hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
5. Press the play key and play the test disc.
6. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 9.

■ OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y

(OPERATING P.C.B. AND KEYS)

The main operations of the unit can be performed by shorting jumper wires on the main P.C.B. even if the FPC board from the control panel is not connected to the main P.C.B.

(When bent the jumper wire, pay attention not to cut it.)

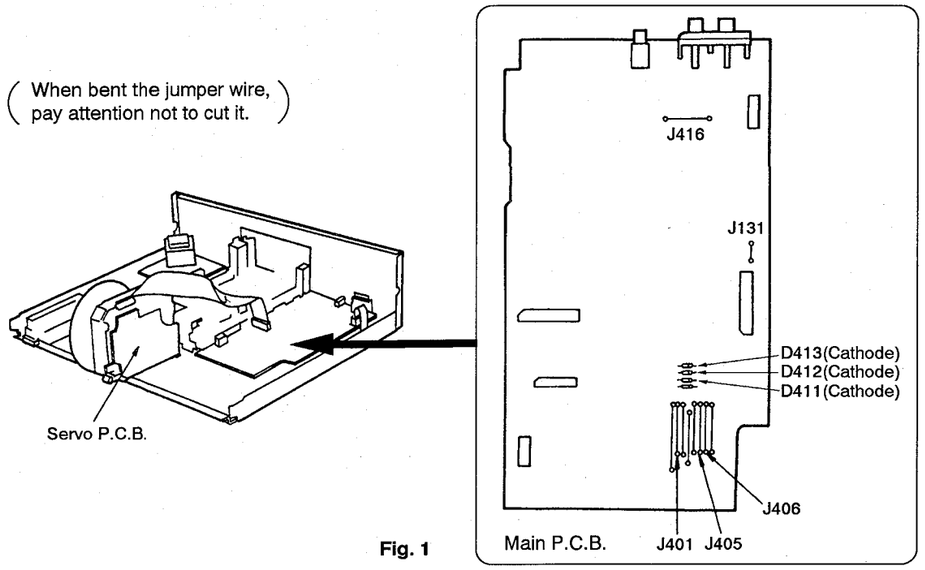
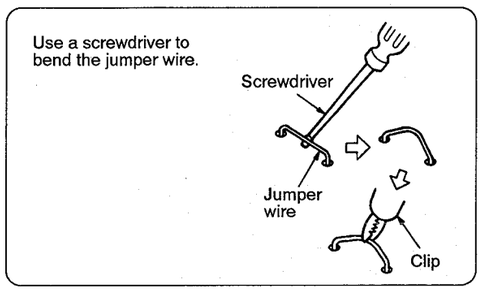


Fig. 1



1. Short the jumpers on the main P.C.B.
   (a. J406 - Cathode of D411 (equivalent to pressing the PLAY key)
   b. J406 - Cathode of D413 (equivalent to pressing the STOP key)
   c. J401 - Cathode of D411 (equivalent to pressing the DISC 1key))
2. Shorting J131 to J416 turns the power ON.
3. After turning on the power, open the 3 shorted jumpers (a to c) in 1.
4. Momentarily short the jumpers shown below as needed. (Fig. 1)
   - To PLAY, short J406 to cathode of D411 (equivalent to pressing the PLAY key)
   - To FWD, short J405 to cathode of D413 (equivalent to pressing the ▶▶| SKIP key)
   - To REW, short J405 to cathode of D411 (equivalent to pressing the |◀◀ SKIP key)
   - To FORWARD, short J401 to cathode of D412 (equivalent to pressing the ▶▶ SEARCH key)
   - To BACKWARD, short J401 to cathode of D413 (equivalent to pressing the ◀◀ SEARCH key)
   - To STOP, short J406 to cathode of D413 (equivalent to pressing the STOP key)
5. The operations for the 6 modes above can be performed.

■ DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS

(SELF-CHECK FUNCTION)

The unit contains a function which displays the result of the automatically adjustment of the servo circuits (tracking, focus servo, etc.) as an error code on the FL display.
The error code display serves as a repair guide showing the automatically adjustment circuit is at fault. The procedures for displaying the error codes are given below.

• Procedures to display the error code

(1) Procedure to display the error code before disassembly (finished unit)
1. When the [POWER] key is pressed while holding down the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys simultaneously, the FL display illuminates, release the power turns on.
2. When the FL display illuminates, release the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys.
3. Press the [OPEN/CLOSE (▲)] key to open the disc tray and load the test disc (SZZP1054C).
4. Press the [PLAY (▶)] key to start the play operation.
5. After the time display appears, press the [STOP (■)] key to display the error code. (e.g. **E-0**)
6. The error code display can be used as a repair guide showing which servo circuit is at fault. (See Error Code Based Troubleshooting.)

(2) Procedure to display the error code when disassembled
1. Prepare the unit as described in "How to Check the Main and Servo P.C.B." on pages 16, 17.
2. Press the [POWER] key while holding down the [STOP (■)], [PLAY (▶)] and [DISC 1] keys simultaneously.
3. When the FL display illuminates, release the [STOP (■)], [PLAY (▶)] and [DISC 1] keys.
4. Load the test disc (SZZP1054C) on the turntable and secure it with the clamper ass'y.
5. Perform steps 4 and 5 in section (1) above.

• Error code based troubleshooting

※ The unit is satisfactory if the error code is **E-0** of **E-2**.
※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal the values of voltage and waveform	
			Signal name	Location	PLAY	STOP
E-1	Focus and tracking offset adjustments did not complete in the specified time period.	① Clocks X1 and X2, power supply VDD, and reset/RST, all on IC702 ② MDATA, MCLK, MLD, and SENSE signals to/from the mechanism controller	MDATA	IC102 ⑧ pin	PLAY 5V 0V T=13.6ms.	4.9V
			MCLK	IC102 ⑦ pin	PLAY 5V 0V T=13.6ms.	4.9V
			MLD	IC102 ⑨ pin		
			SENSE	IC102 ⑩ pin	0V	0V
			/RST	IC102 ⑱ pin	4.9V	4.9V
			X1	IC102 ㊽ pin	1.5V p-p F=16.9344MHz	1.5V p-p F=16.9344MHz
			X2	IC102 ㊾ pin	5.4V p-p F=16.9344MHz	5.4V p-p F=16.9344MHz
E-3 E-5 E-7 E-9 E-B E-D E-F	Disc play unstable	① Scratches or contaminants on disc surface ② Focus and tracking servo circuits (check waveforms, voltages, and part constants.) ③ Spindle driver circuit ④ Optical pickup	FE	IC102 ㊷ pin	PLAY 0.2V p-p 2ms.0.1V/DIV.	2.4V
			TE	IC102 ㊸ pin	PLAY 0.3V p-p 2ms.0.1V/DIV.	2.4V
			FOD	IC102 ㉘ pin	2.4V	2.4V
			TRD	IC102 ㉗ pin	2.4V	2.4V
			KICK	IC102 ㉖ pin	2.4V	2.4V
			/FLOCK	IC102 ⑪ pin	0V	4.9V
			/RF DET	IC102 ㊽ pin	0V	4.8V
			RF	TJ101	PLAY 0.5V p-p 0.5μs 0.1V/DIV.	3.4V
			STAT	IC102 ⑰ pin	2.8V	0V

FL error code display	Symptom	Probable cause	Signal to check		Normal the values of voltage and waveform	
			Signal name	Location	PLAY	STOP
E-4 E-6	Focus gain adjustment did not complete in the specified time period.	① Scratches or contaminants on disc surface ② Focus servo circuit (check waveforms, voltages, and part constants.) ③ Optical pickup	FE	IC102 ㊷ pin	PLAY 0.2V p-p 2ms.0.1V/DIV.	2.4V
			OFT	IC102 ㊱ pin	0V	0V
			/TLOCK	IC102 ⑫ pin	0V	0V
E-8 E-A	Tracking gain adjustment did not complete in the specified time period.	① Scratches or contaminants on disc surface ② Tracking circuit (check waveforms, voltages, and part constants.) ③ Optical pickup	TE	IC102 ㊸ pin	PLAY 0.3V p-p 2ms.0.1V/DIV.	2.4V
			OFT	IC102 ㊱ pin	0V	0V
			/TLOCK	IC102 ⑫ pin	0V	0V
E-C E-E	Perform the same check as for error codes 〈E4, E6〉 and 〈E8, A〉.		FE	IC102 ㊷ pin	PLAY 0.2V p-p 2ms.0.1V/DIV.	2.4V
			TE	IC102 ㊸ pin	PLAY 0.3V p-p 2ms.0.1V/DIV.	2.4V
			OFT	IC102 ㊱ pin	0V	0V
			/TLOCK	IC102 ⑫ pin	0V	0V

■ NEW DIGITAL SERVO CIRCUIT

Notes:
1. There are two types A and B of new digital servo circuit.
2. Refer to "How to distinguish between A and B" shown below.
3. There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MN662712RA.

• How to distinguish between types A and B.

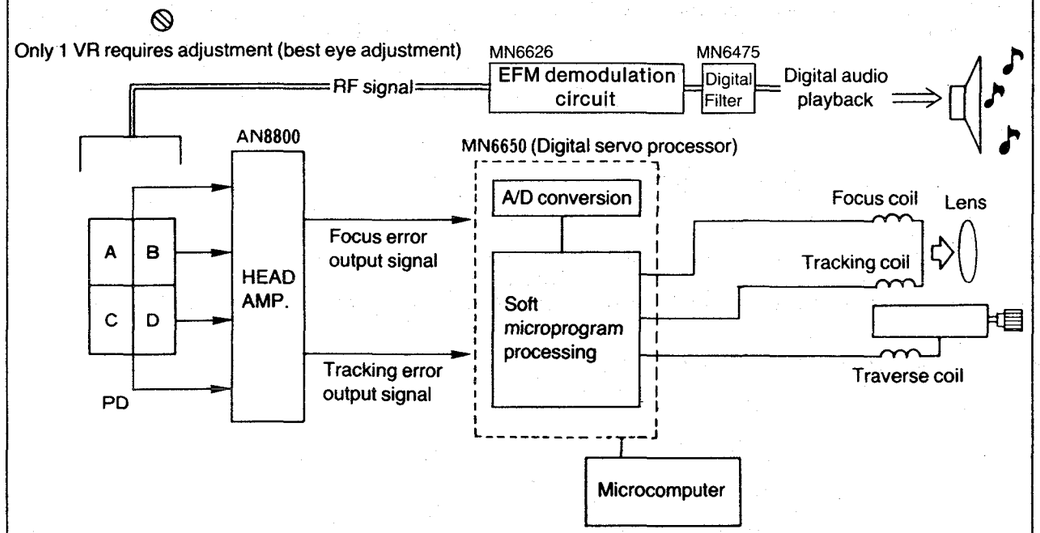
Part No. / Ref. No.	Type A	Type B
IC		
IC102	MN66271	MN662712RA
VARIABLE RESISTOR		
VR101	EVND3AA00B14	Not mounted
RESISTORS		
R114	ERJ6GEYJ224V	ERJ6GEYJ104V
R134−136	ERJ6GEY0R00V	ERJ6GEYJ331V
CHIP JUMPERS		
RJ101	Not mounted	ERJ6GEY0R00V
CAPACITORS		
C105	Not mounted	ECUV1E273KBN
C106	Not mounted	ECUV1H101JCN
C112	Not mounted	ECUV1E273KBN
C143	Not mounted	ECBT1H331KB5
C144	Not mounted	ECBT1H331KB5

■ NEW DIGITAL SERVO SYSTEM

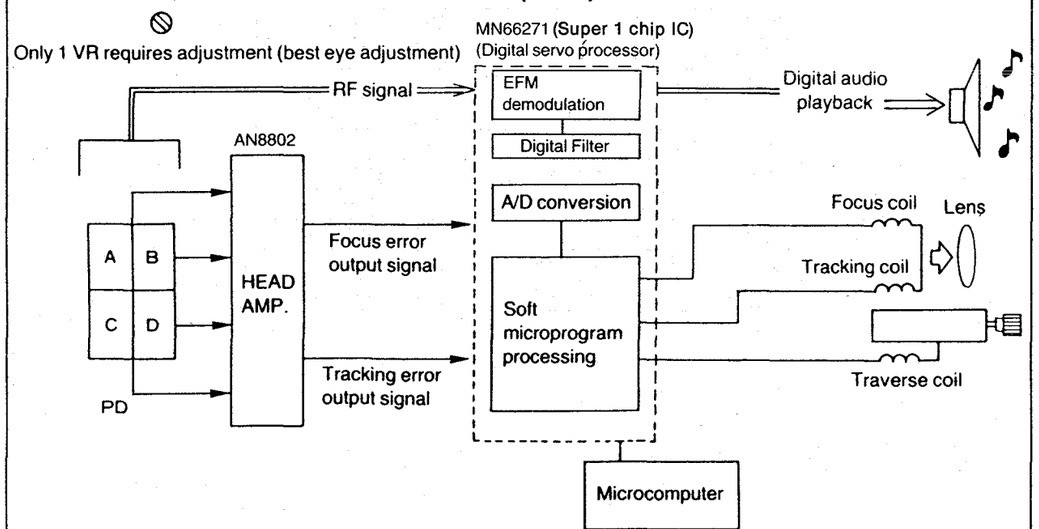
This model employs a new digital servo circuit (super 1 chip IC: MN66271/MN662712RA). Compared to the old digital servo circuit, the following points have been improved.

1. **Reduced number of parts**
   Use of a super 1 chip IC
   3 chips (MN6626, MN6650, MN6475) are reduced to a super 1 chip (MN66271/MN662712RA)
2. **Reduced access time**
   [(old) 2.9 seconds → (new) 1.9 seconds]
   Change of traverse gear
3. **Improved vibration resistance**
   Rubber and spring 2-level floating mechanism
   [fo=50Hz (old) → 20Hz (new)]
4. **All adjustment VRs have been deleted for type B.**

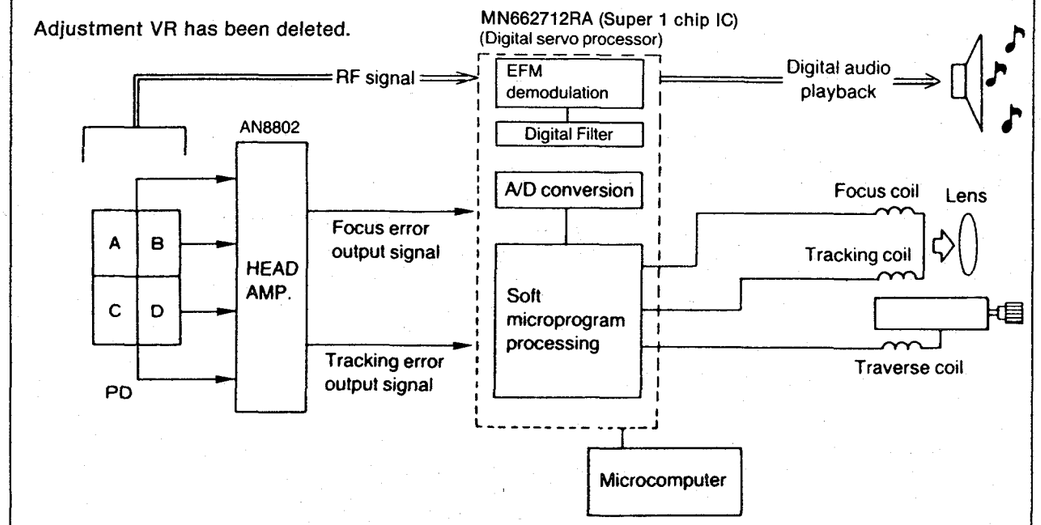
DIGITAL SERVO SYSTEM (OLD)



DIGITAL SERVO SYSTEM FOR TYPE A (NEW)

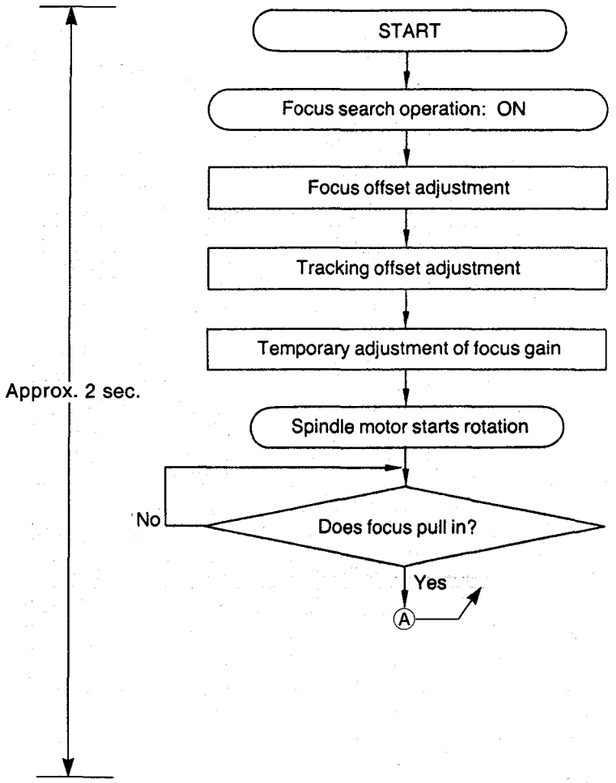


DIGITAL SERVO SYSTEM FOR TYPE B (NEW)

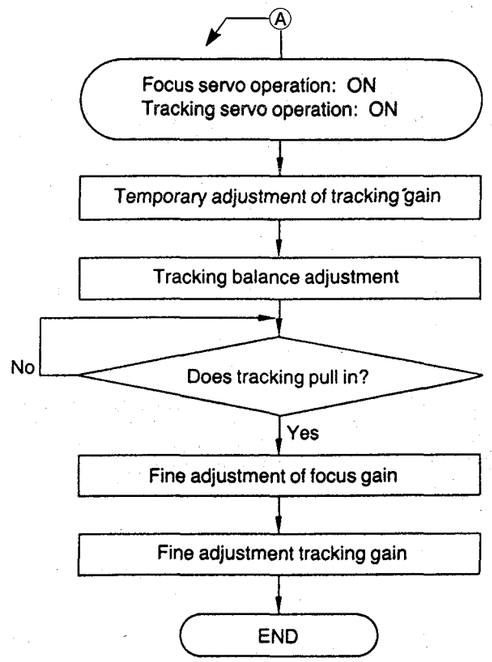


The following flow chart shows the sequence of automatic adjustments.

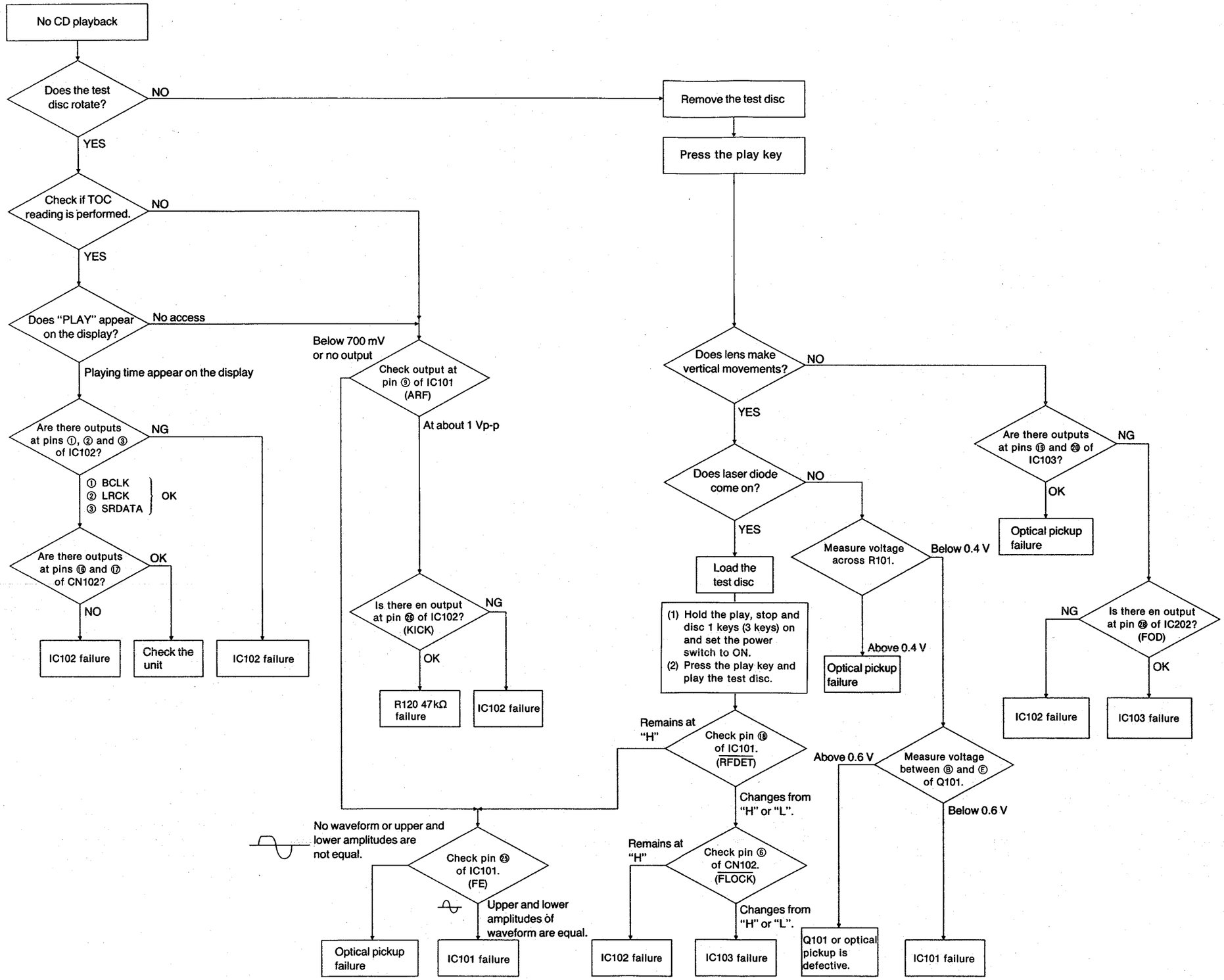
- ***Flow chart on automatic adjustment sequence***



* Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.



■ TROUBLESHOOTING GUIDE


No CD playback
Does the test disc rotate?
NO
YES
Check if TOC reading is performed.
NO
YES
Does "PLAY" appear on the display?
No access
Playing time appear on the display
Are there outputs at pins ①, ② and ③ of IC102?
NG
① BCLK
② LRCK
③ SRDATA
OK
Are there outputs at pins ⑯ and ⑰ of CN102?
OK
NO
IC102 failure
Check the unit
IC102 failure
Below 700 mV or no output
Check output at pin ⑨ of IC101 (ARF)
At about 1 Vp-p
Is there en output at pin ㉘ of IC102? (KICK)
NG
OK
R120 47kΩ failure
IC102 failure
No waveform or upper and lower amplitudes are not equal.
Check pin ㉕ of IC101. (FE)
Upper and lower amplitudes of waveform are equal.
Optical pickup failure
IC101 failure
Remove the test disc
Press the play key
Does lens make vertical movements?
NO
YES
Does laser diode come on?
NO
YES
Load the test disc
(1) Hold the play, stop and disc 1 keys (3 keys) on and set the power switch to ON.
(2) Press the play key and play the test disc.
Measure voltage across R101.
Below 0.4 V
Above 0.4 V
Optical pickup failure
Remains at "H"
Check pin ⑱ of IC101. (RFDET)
Changes from "H" or "L".
Remains at "H"
Check pin ⑥ of CN102. (FLOCK)
Changes from "H" or "L".
IC102 failure
IC103 failure
Above 0.6 V
Measure voltage between Ⓑ and Ⓔ of Q101.
Below 0.6 V
Q101 or optical pickup is defective.
IC101 failure
Are there outputs at pins ⑲ and ⑳ of IC103?
NG
OK
Optical pickup failure
NG
Is there en output at pin ㉘ of IC202? (FOD)
OK
IC102 failure
IC103 failure

■ MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 2.

Measuring Instruments and Special Tools

* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)
* Musical program disc (ordinary)
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe).
* Allen wrench (M2.0) (SZZP1101C)
* Allen wrench (M1.27)
* 0.9mm clearance gauge (RZZ0297)
* Filter
* Lock paint (RZZ0L01)

PREPARATION

1. Remove the cabinet and front panel ass'y (refer to "disassembly instructions" Ref. No. 1, 2).
2. Set the power switch to ON and press the open/close key to close the loading drawer.
3. Press the play key and when the traverse deck reaches it's height position, set the power switch to OFF.
4. Remove the tray ass'y (refer to "disassembly instructions" Ref. No. 3).
5. Remove the clamp plate, yoke, magnet and clamper (refer to "disassembly instructions" Ref. No. 8, 9).
6. Place the test disc and secure it by using clamper ass'y. (Refer to Fig. 1)
(refer to "disassembly instructions" Ref. No. 9).
7. Set the unit in the test mode as follows:
(hold the play, stop and disc 1 keys (3 keys) on and set the power switch to ON.)
8. Press the play key and play the test disc.
9. Follow the adjustment procedure.

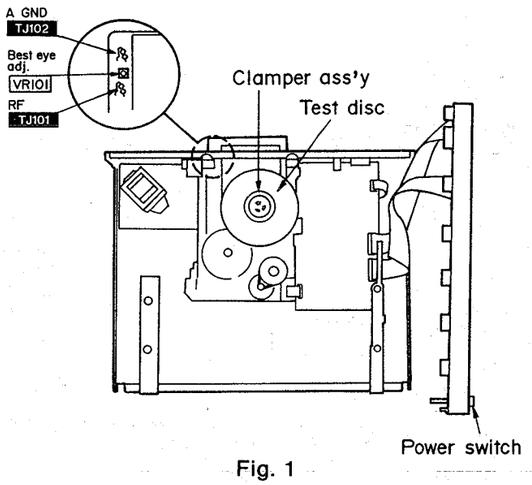


Fig. 1

Adjusting Procedure

* If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base. (Refer to Fig. 2).
2. Tighten the turntable retention screw with the 1.27mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across TP1 (+) and TP2 (−) terminal via a filter (Refer to Fig. 3).

Note: For the connection of oscilloscope's CH. 1 probe to servo P.C.B. on foil side, refer to fig. 2.

Oscilloscope setting: VOLT 500mV
SWEEP..... 5ms.
Input coupling..... DC

4. Adjust oscilloscope's DC zero balance.
5. Switch the play power **ON**, and play the test disc (SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

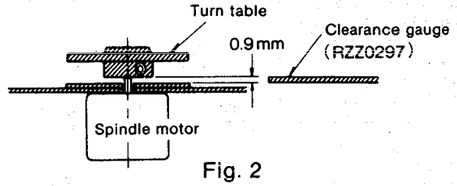


Fig. 2

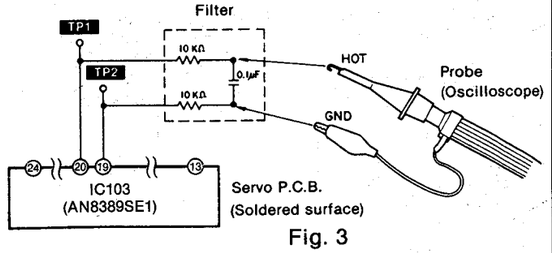


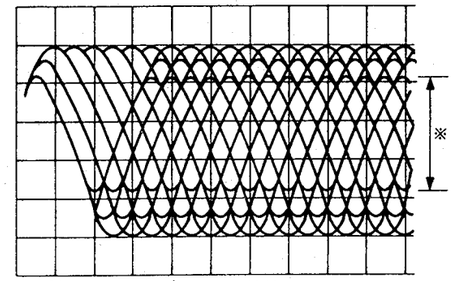
Fig. 3

7. Adjust the height until the voltage is **0±1.0V**.
If the voltage exceeds **+1.0V**, lower turntable.
If the voltage is below **−1.0V**, elevate the turn table.

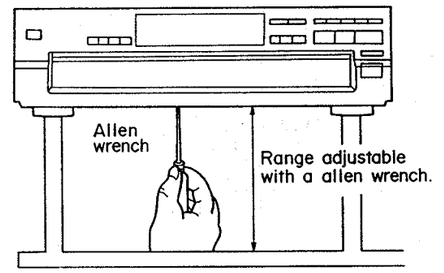
Note: Mesure the voltage as 0V as possible.

(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
Oscilloscope setting: VOLT 100mV
SWEEP..... 0.5μs.
Input coupling..... AC
2. Switch the player power **ON**, and play track **7** on the test disc (SZZP1056C).
(Playing any other track will prevent the HEX screws from being accessed.)
3. Leave the player in play mode and place it as shown Fig. 5.
4. Alternately adjust the two HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 4)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



※ Most stretched eye pattern.
Fig. 4



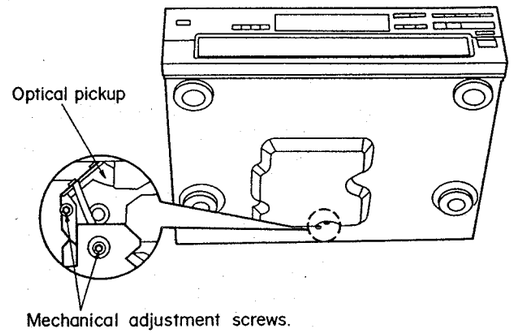
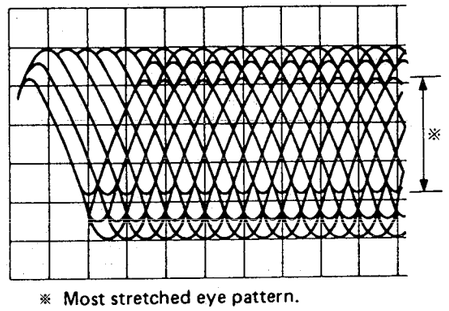


Fig. 5

(3) BEST EYE (PD BALANCE) ADJUSTMENT FOR TYPE A

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
Oscilloscope setting: VOLT 100mV
SWEEP..... 0.5μs.
Input coupling..... AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 6)



※ Most stretched eye pattern.
Fig. 6

(4) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* **Checking Skip Search**
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* **Checking Manual Search**
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* **Checking Playability**
1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

■ TERMINAL FUNCTION OF IC'S

• IC101 (AN8802SCE1V): Servo amp

Pin No.	Mark	I/O Division	Function
1	PDAD	I	Photo detector Bch input without delay
2	PDA	I	Photo detector Ach input without delay
3	LPD	I	Laser PD signal
4	LD	O	Laser power auto control output
5	AMPI	I	RF amp terminal
6	V_{CC}	I	Power supply terminal
7	AMPO	O	RF amp signal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal
10	CENV	I	RF detect capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	GND	—	GND terminal
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	TES	I	Tracking error shunt input ("H": shunt)
15	PLAY	I	Play signal ("H": ON, "L": OFF)
16	WVEL	I	Double velocity ("H": double, "L": single)

Pin No.	Mark	I/O Division	Function
17	BDO	O	Dropout detection control
18	/RFDET	O	RF det. signal ("L": det.)
19	CROSS	O	Tracking error zero cross output
20	OFTR	O	Off track detection ("H": det.)
21	VDET	O	Oscillation det. signal ("H": det.)
22	ENV	O	Envelope output terminal
23	TEBPF	I	Oscillation detect input terminal (Not used, open)
24	TE	O	Tracking error signal
25	FE	O	Focusing error signal
26	PTO	O	Potention amp output
27	PTI	I	Potention amp input
28	TBAL	I	Tracking balance adj. input
29	FBAL	I	Focus balance adj. input
30	VREF	O	Reference voltage output
31	PDB	I	Photo detector Ach input with delay
32	PDBD	I	Photo detector Bch input with delay

• IC103 (AN8389SE1): Coil/motor drive

Pin No.	Mark	I/O Division	Function
1	V_{CC}	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	GND terminal
6	NC	—	Not used, connected to GND
7	NRESET	I	Reset terminal (Not used, open)
8	GND	—	GND terminal
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, open)

Pin No.	Mark	I/O Division	Function
13	$PV_{CC}1$	I	Driver power suppiy (1)
14	PGND1	—	Driver GND terminal (1)
15	D1−	O	Motor driver (1) output terminal (−)
16	D1+	O	Motor driver (1) output terminal (+)
17	D2−	O	Motor driver (2) output terminal (−)
18	D2+	O	Motor driver (2) output terminal (+)
19	D3−	O	Motor driver (3) output terminal (−)
20	D3+	O	Motor driver (3) output terminal (+)
21	D4−	O	Motor driver (4) output terminal (−)
22	D4+	O	Motor driver (4) output terminal (+)
23	PGND2	—	Driver GND terminal (2)
24	$PV_{CC}2$	I	Driver power supply (2)

• IC102 (MN66271/MN662712RA): Servo processor/digital signal processor/digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial bit clock terminal
2	LRCK	O	L/R discriminating signal
3	SRDATA	O	Serial data (Not used, open)
4	$DV_{DD}1$	I	Power supply (digital circuit) terminal
5	$DV_{SS}1$	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Command clock signal
8	MDATA	I	Command data signal
9	MLD	I	Command load signal ("L": LOAD)
10	SENSE	O	Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Optical servo condition (focus) ("L": lead-in)
12	/TLOCK	O	Optical servo condition (tracking) ("L": lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz) (Not used, open)
14	SQCK	I	Sub-code Q register clock
15	SUBQ	O	Sub-code Q data
16	DMUTE	I	Muting input ("H": MUTE) (Not used, connected to GND)
17	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
18	/RST	I	Reset signal ("L": reset)
19	SMCK	O	System clock (f=4.2336MHz) (Not used, open)
20	PMCK	O	Frequency division clock signal (Not used, open) ($f=\frac{1}{1.92}\times ck=88.2kHz$)
21	TRV	O	Traverse servo control
22	TVD	O	Traverse drive signal
23	PC	O	Turntable motor drive signal ("L": ON)
24	ECM	O	Turntable motor drive signal (Forced mode)
25	ECS	O	Turntable motor drive signal (Servo error signal)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal
30	FBAL	O	Focus balance adj. output (Not used, open)
31	TBAL	O	Tracking balance adj. output
32	FE	I	Focus error signal (analog input)
33	TE	I	Tracking error signal (analog input)
34	RFENV	I	RF envelope signal
35	VDET	I	Oscillation det. signal ("H": det.)
36	OFT	I	Off frack signal ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal ("L": detection)
39	BDO	I	Dropout detection signal ("H": dropout)
40	LDON	O	Laser power control ("H": ON)
41	TES	O	Tracking error shunt output ("H": dropout)
42	PLAY	O	Play signal ("H": play)

Pin No.	Mark	I/O Division	Function
43	WVEL	O	Double velocity status signal ("H": double)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias terminal (Not used, open)
47	DSLF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal (Not used, open)
50	$AV_{DD}2$	I	Power supply (analog circuit) terminal (2)
51	$AV_{SS}2$	—	GND (analog circuit) terminal
52	EFM	O	EFM signal (Not used, open)
53	PCK	O	PLL extract clock (f=4.3218MHz)
54	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)
55	SUBC	O	Sub-code serial output data (Not used, open)
56	SBCK	I	Sub-code serial output clock (Not used, connected to GND)
57	V_{SS}	—	GND terminal
58	X1	I	Crystal oscillator terminal (f=16.9344MHz)
59	X2	O	
60	V_{DD}	I	Power supply terminal
61	BYTCK	O	Byte clock signal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal (f CLDCK=7.35kHz: Normal) (Not used, open)

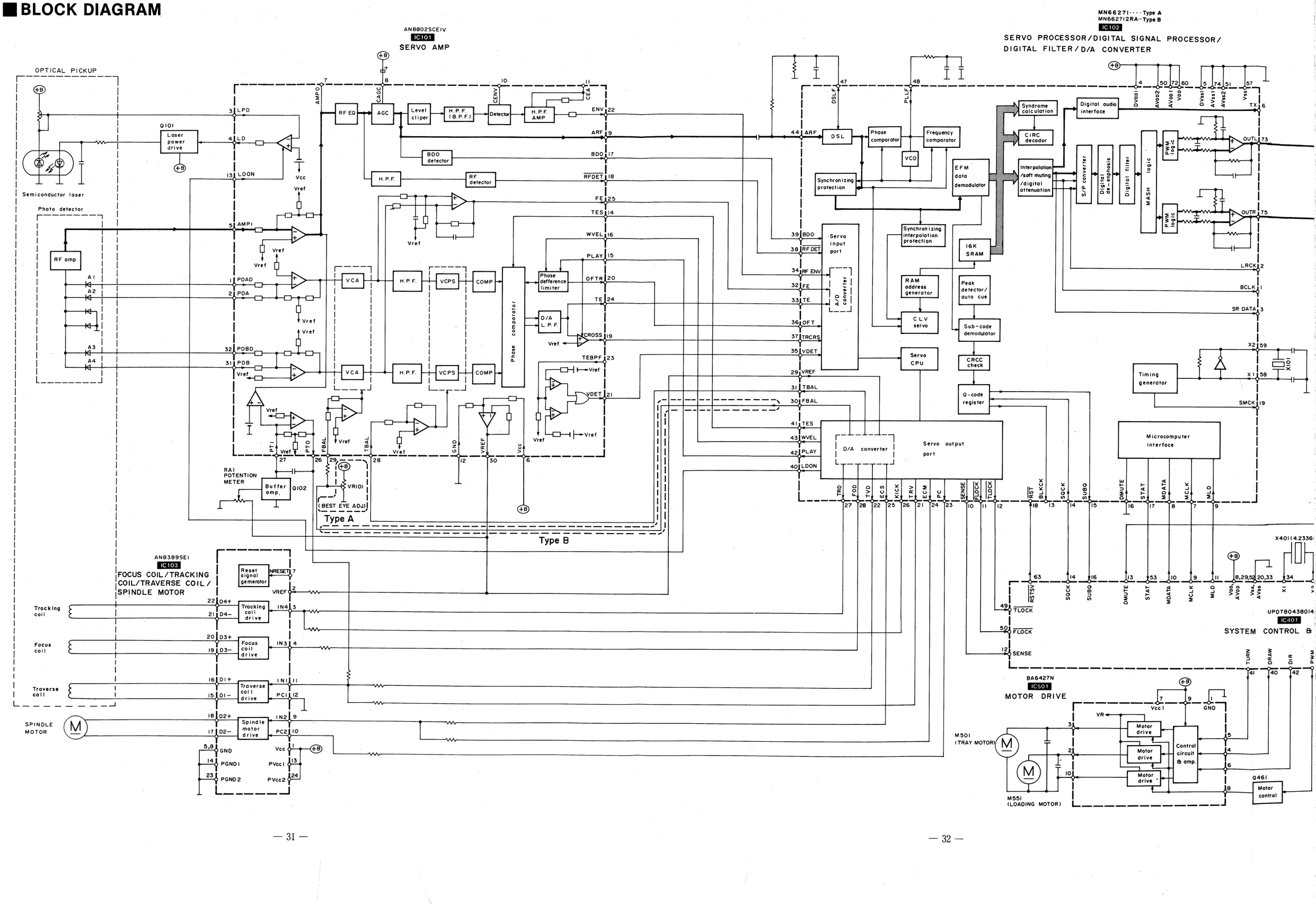
Pin No.	Mark	I/O Division	Function
63	FCLK	O	Crystal frame clock (Not used, open)
64	IPFLAG	O	Interpolation flag terminal
65	FLAG	O	Flag terminal
66	CLVS	O	Turntable servo phase synch. signal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check terminal ("H": OK, "L": NG)
68	DEMPH	O	De-emphasis ON signal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
70	/RST2	I	Reset terminal after "MASH" circuit
71	/TEST	I	Test terminal (Normal: "H")
72	$AV_{DD}1$	I	Power supply (analog circuit) terminal (1)
73	OUTL	O	Lch audio signal
74	$AV_{SS}1$	—	GND (analog circuit) terminal (1)
75	OUTR	O	Rch audio signal
76	RSEL	I	Polarity direction control terminal of RF signal
77	CSEL	I	Frequency control terminal of crystal oscillator (Not used, connected to GND)
78	PSEL	I	Test terminal (Normal: "L")
79	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz)
80	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)

• IC401 (UPD78043B014): System control & FL drive

Pin No.	Mark	I/O Division	Function
1 ∫ 7	G7 ∫ G1	O	FL grid signal
8	VDD	I	Power supply terminal
9	MCLK	O	Command clock signal
10	MDATA	O	Command data signal
11	MLD	O	Command load signal ("L": LOAD)
12	SENSE	I	Sense signal
13	DMUTE	O	Muting control signal
14	SQCK	O	Sub-code Q register clock
15	NC	—	Not connected
16	SUBQ	I	Sub-code Q data
17	/RESET	I	Reset signal input
18	TIMER	—	Not used, connected to GND
19	REC. EN	I	Synchro rec. control terminal
20	AVSS	—	GND terminal
21 ∫ 24	KEY IN 8 ∫ KEY IN 5	I	Key return signal
25 ∫ 28	KEY IN 4 ∫ KEY IN 1	I	Key return signal
29	AVDD	I	Power supply terminal
30	AVREF	I	Power supply terminal
31	XT1	—	Not used, connected to GND
32	XT2	—	Not used, open
33	VSS	—	GND terminal
34	X1	I	Crystal OSC terminal (f=4.2336MHz)
35	X2	O	
36	DISC	I	Disc det. terminal
37	OPEN	I	Open detect terminal
38	DOWN	I	Traverse deck down det. terminal
39	UP	I	Traverse deck up det. terminal
40	DRAW	O	Motor control signal

Pin No.	Mark	I/O Division	Function
41	TRUN	O	Motor control signal
42	DIR	O	
43	PWM	O	
44	POSITION	I	Rotary tray position det. terminal
45	SYNCHRO	O	Synchro rec. control terminal
46	SPEED	I	Loading motor speed sensor signal
47	REMOCON	I	Remote control signal
48	IC	—	Not used, connected to GND
49	/TLOCK	I	Optical servo condition (tracking) input
50	/FLOCK	I	Optical servo condition (focus) input
51	PITCHLED	O	Not used, open
52	VDD	I	Power supply terminal
53	STAT	I	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
54 ∫ 58	KEY OUT 5 ∫ KEY OUT 1	O	Key scan signal
59	MODEL 2	—	Model selector terminal (Not used, open)
60	MODEL 1	—	
61	PMETHOD	—	Not used, open
62	EMPHA	—	Not used, open
63	/RSTSV	O	Reset terminal of servo IC
64	DAC	—	Not used, open
65 ∫ 70	S12 ∫ S7	O	FL segment signal
71	VPP	I	Power supply terminal
72 ∫ 77	S6 ∫ S1	O	FL segment signal
78	G10	—	Not used, open
79 • 80	G9 • G8	O	FL grid signal

■ BLOCK DIAGRAM



MN6627I····Type A
MN662712RA···Type B
IC102

SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/
DIGITAL FILTER/D/A CONVERTER

Type B

UPD78043B014
IC401
SYSTEM CONTROL & FL DRIVE

BA6427N
IC501
MOTOR DRIVE

BA4558FTI
IC801

BA4558FTI
IC451

LM2940T5M
IC11

Note:
Audio signal

■ SCHEMATIC DIAGRAM (Parts list on pages 46, 47, 53.)

(This schematic diagram may be modified at any time with development of new technology.)

Note:

- **S551** : Up/down det. switch.
- **S552** : Open det. switch.
- **S601** : Time mode (TIME MODE) select switch.
- **S602** : Spiral (SPIRAL) switch.
- **S603** : Random (RANDOM) switch.
- **S604** : Repeat (REPEAT) switch.
- **S608, 609** : Search (SEARCH) switches. (S608: ◀◀, S609: ▶▶)
- **S610~614** : Disc (DISC 1~5) switches. (S610: 1, S611: 2, S612: 3, S613: 4, S614: 5)
- **S615** : Program mode (PROGRAM MODE) switch.
- **S616, 617** : Skip (SKIP) switches. (S616: I◀◀, S617: ▶▶I)
- **S618** : Disc skip (DISC SKIP) switch.
- **S619** : Loading drawer open/close (▲ OPEN/CLOSE) switch.
- **S620** : Stop (■ STOP) switch.
- **S621** : Pause (▮▮ PAUSE) switch.
- **S622** : Play (▶ PLAY) switch.
- **S624** : Power (POWER) switch.
- **S701** : Voltage adj. switch in "240V" position. (110V↔127V↔220V↔240V) (For (GC) area only.)

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

*The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occation calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

Part No.	Production Part No.	Supply Part No.
IC11	LM2940T5M	LM2940T5
IC451, 801	BA4558FT1	SVIBA4558F

- ▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
  ⋯⋯ : Audio signal lines.

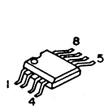
Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

• Terminal guide of IC's, transistors and diodes

BA4558FT1



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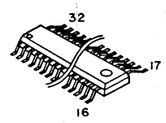
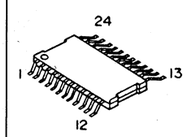
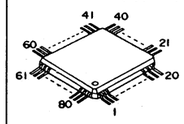


AN8389SE1



MN66271 (Type A)
MN662712RA (Type B)



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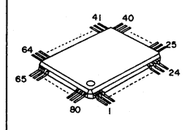
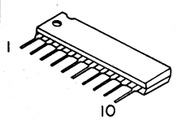
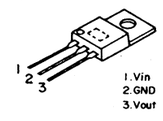


BA6247N



LM2940T5M



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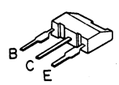
2SB1238QSTV6



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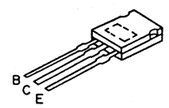

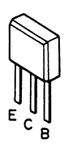

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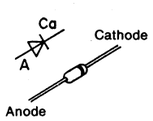
2SD1450RSTTA
UN4112TA
UN4212TA
UN4215TA
DTC143ESTP

MA165TA



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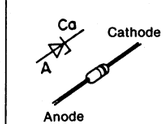

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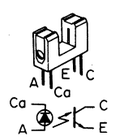

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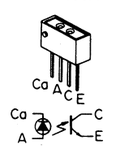
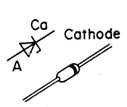
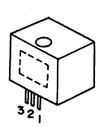
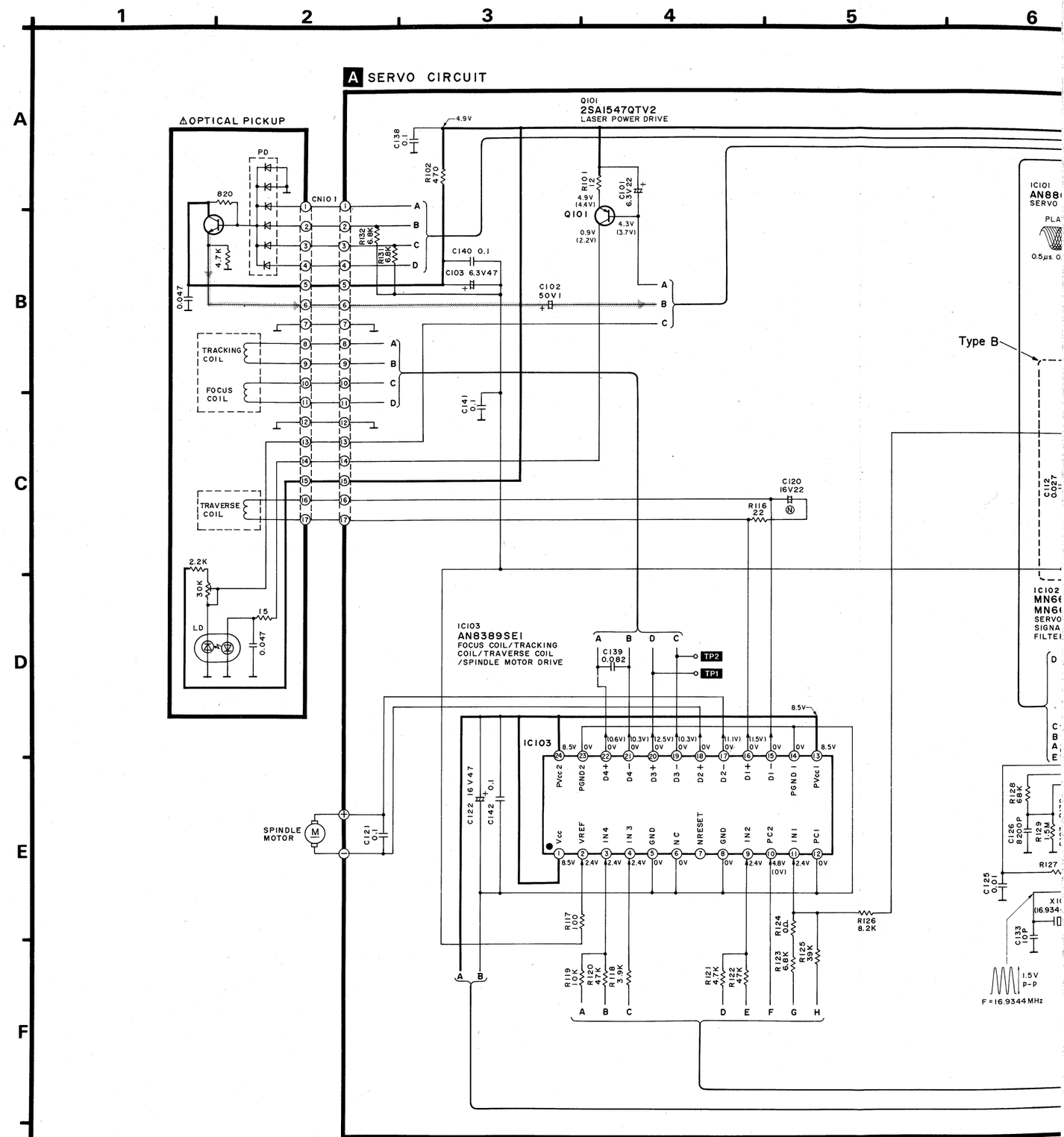




MA4091MTA
MA4100MTA
MA4270MTA
MA4082MTA
MA4062MTA
M4051MTA

RCDHC-577-E





A SERVO CIRCUIT

△OPTICAL PICKUP

PD

820

4.7K

CN101

R132 68K

R131 6.8K

C140 0.1

C103 6.3V47

0.047

C102 50V1

TRACKING COIL

FOCUS COIL

C141 0.1

TRAVERSE COIL

C120 16V22

R116 22

2.2K

30K

15

LD

0.047

Q101
2SAI547QTV2
LASER POWER DRIVE

C138 0.1

4.9V

R102 470

R101 12

4.9V (4.4V)

Q101

0.9V (2.2V)

C101 6.3V22

4.3V (3.7V)

IC103
AN8389SE1
FOCUS COIL/TRACKING COIL/TRAVERSE COIL /SPINDLE MOTOR DRIVE

C139 0.082

TP2

TP1

8.5V

PVcc2 PGND2 D4+ D4− D3+ D3− D2+ D2− D1+ D1− PGND1 PVcc1

Vcc VREF IN4 IN3 GND NC NRESET GND IN2 PC2 IN1 PC1

SPINDLE MOTOR

C121 0.1

C122 16V47

C142 0.1

R117 100

R119 10K

R120 47K

R118 3.9K

R121 47K

R122 47K

R123 6.8K

R124 0Ω

R125 3.9K

R126 8.2K

Type B

IC101
AN8802SCE1V
SERVO AMP

C105 0.027

C106 100P

C107 50V1

(RF)

TJ101

(A.GND)

TJ102

C104 6.3V100

Play 0.5Vp-p 0.5μs. 0.1V/DIV.

PLAY 1.2V p-p 0.5μs. 0.2V/DIV.

WVEL PLAY TES LDON GND CEA CENV ARF CAGC AMPO Vcc AMPI LD LPD PDA PDAD

PLAY 0.4V p-p 2ms. 0.2V/DIV.

IC101

Q102
2SAI547QTV2
BUFFER AMP (POTENTION METER)

BDO /RFDET CROSS OFTR VDET ENV TEBPF TE FE PTO PTI TBAL FBAL VREF PDB PDBD

R110 10K

R111 10K

R113 10K

R112 1K

R115 47K

C111 330P

R114 220K···Type A 100K···Type B

R106 470

C109 0.22

R105 4.7K

VR101 10K(B)

Best eye adj.

Type A

PLAY 0.3V p-p 2ms. 0.2V/DIV.

C112 0.027

C114 470P

C117 1200P

C119 470P

R104 100

Q102

RA1 POTENTION METER(5K)

R103 12K

C108 6.3V47

PLAY 0.3V p-p 2ms. 0.1V/DIV.

PLAY 0.2V p-p 2ms. 0.1V/DIV.

Type B

IC102
MN66271 ····· Type A
MN662712RA ··· Type B
SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER & D/A CONVERTER

PLAY 1.2V p-p 0.5μs. 0.2V/DIV.

IC102

TES PLAY WVEL ARF IREF DRF DSLF PLLF VCOF AVDD2 AVSS2 EFM PCK PDO SUBC SBCK Vss X I X 2 Vdd

LDON BDO /RFDET TRCRS OFT VDET RFENV TE FE TBAL FBAL VREF FOD TOD KICK ECS ECM Pc TVD TRV

PLAY 5V 0V T=13.6ms.

C143 330P

C144 330P

Type B

PMCK SMCK /RST STAT D MUTE SUBQ S QCK BLKCK /TLOCK /FLOCK SENSE MLD MDATA MCLK TX DVss1 DVdd SRDATA LRCK BCLK

PLAY 5V 0V T=13.6ms.

PLAY 5V 0V T=13.6ms.

PLAY 4V p-p 1KHz, 0dB

C124 560P

R128 68K

R130 220

C126 8200P

R129 1.5M

C127 0.22

R127 150K

C125 0.01

X101 (16.9344MHz)

C133 10P

C134 10P

1.5V p-p F=16.9344MHz

5.4V p-p F=16.9344MHz

C135 6.3V100

C136 0.1

R133 100

C131 6.3V100

C132 0.1

C137 6.3V100

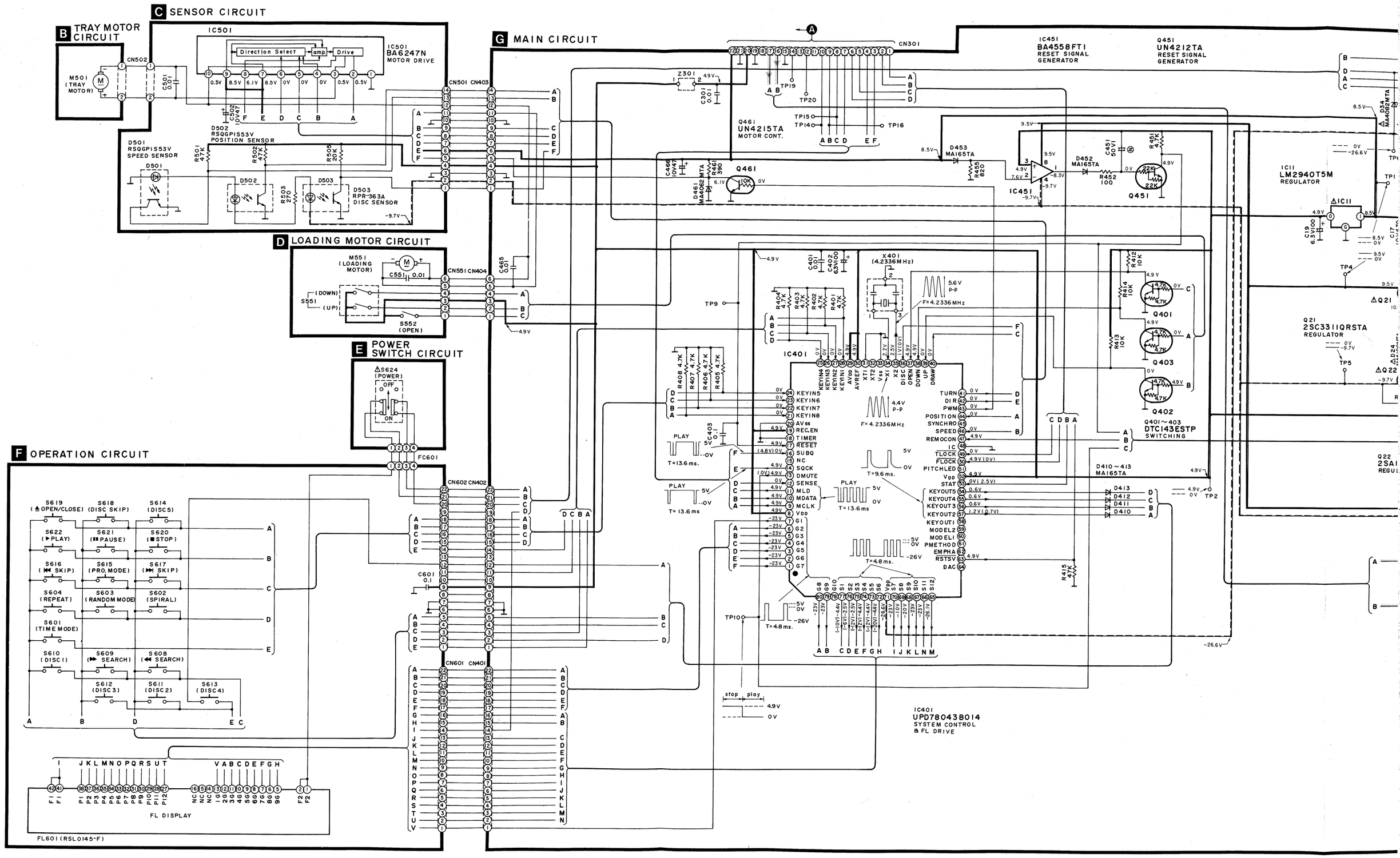
4.9V

R134, R135, R136 0Ω ··· Type A 330 ··· Type B

CN102

8.5V

A


C SENSOR CIRCUIT
B TRAY MOTOR CIRCUIT
M501 (TRAY MOTOR)
CN502
C501 0.01
IC501
Direction Select
amp
Drive
IC501 BA6247N MOTOR DRIVE
0.5V 8.5V 6.1V 8.5V 0V 0V 0V 0.5V 0.5V
C502 0.47
F E D C B A
D502 RSQGPIS53V POSITION SENSOR
D501 RSQGPIS53V SPEED SENSOR
R501 47K
R502 47K
R506 22K
D501
D502
D503
R503 270
D503 RPR-363A DISC SENSOR
-9.7V
CN501 CN403
D LOADING MOTOR CIRCUIT
M551 (LOADING MOTOR)
C551 0.01
S551 (DOWN) (UP)
S552 (OPEN)
CN551 CN404
C465 0.01
4.9V
E POWER SWITCH CIRCUIT
S624 (POWER) OFF ON
FC601
CN602 CN402
F OPERATION CIRCUIT
S619 (▲OPEN/CLOSE)
S618 (DISC SKIP)
S614 (DISC5)
S622 (▶PLAY)
S621 (❚❚PAUSE)
S620 (■STOP)
S616 (⏮SKIP)
S615 (PRO.MODE)
S617 (⏭SKIP)
S604 (REPEAT)
S603 (RANDOM MODE)
S602 (SPIRAL)
S601 (TIME MODE)
S610 (DISC1)
S609 (⏩SEARCH)
S608 (⏪SEARCH)
S612 (DISC3)
S611 (DISC2)
S613 (DISC4)
C601 0.1
CN601 CN401
FL DISPLAY
FL601 (RSL0145-F)
G MAIN CIRCUIT
CN301
Z301
C301 0.01
TP19
TP20
TP15
TP14
TP16
Q461 UN4215TA MOTOR CONT.
ABCD EF
C466 10V47
D461 MA4062MTA
R461 390
R455 820
D453 MA165TA
IC451 BA4558FTI RESET SIGNAL GENERATOR
D452 MA165TA
R452 100
C451 50V1
R451 4.7K
22K
Q451 UN4212TA RESET SIGNAL GENERATOR
IC11 LM2940T5M REGULATOR
C19 6.3V100
TP1
TP4
TP5
Q21 2SC3311QRSTA REGULATOR
Q401 Q402 Q403
R414 10K
R413 10K
R412 10K
Q401~403 DTC143ESTP SWITCHING
D410~413 MA165TA
D413 D412 D411 D410
TP2
C401 0.01
C402 6.3V100
X401 (4.2336MHz)
5.6V p-p
F=4.2336MHz
IC401
R404 4.7K
R403 4.7K
R402 4.7K
R401 4.7K
R409 4.7K
R408 4.7K
R407 4.7K
R406 4.7K
R405 4.7K
KEYIN4 KEYIN3 KEYIN2 KEYIN1 AVDD AVREF XT1 XT2 VSS VDD X2 X1 DISC OPEN DOWN UP DRAW
KEYIN5 KEYIN6 KEYIN7 KEYIN8 AVSS REC.EN TIMER RESET SUBQ NC SQCK DMUTE SENSE MLD MDATA MCLK VDD
G1 G2 G3 G4 G5 G6 G7
G8 G9 G10 S1 S2 S3 S4 S5 S6 VEE S7 S8 S9 S10 S11 S12
TURN DIR PWM POSITION SYNCHRO SPEED REMOCON IC TLOCK FLOCK PITCHLED VDD STAT
KEYOUT5 KEYOUT4 KEYOUT3 KEYOUT2 KEYOUT1 MODEL2 MODEL1 PMETHOD EMPHA RSTSV DAC
C403 0.1
PLAY 5V 0V T=13.6ms.
T=9.6ms.
T=4.8ms.
R415 47K
TP9
TP10
stop play 4.9V 0V
IC401 UPD78043B014 SYSTEM CONTROL & FL DRIVE
-26.6V

15 16 17 18 19 20 21 22 23 24

MAIN CIRCUIT

CN301

IC451
BA4558FTI
RESET SIGNAL GENERATOR

Q451
UN4212TA
RESET SIGNAL GENERATOR

Q31
2SB1238QSTV6
REGULATOR

D11,12,31,32
RLN4003N02

H POWER SUPPLY CIRCUIT For (E,GN) areas.

CN701 PT701 L701 L702 JK701 AC 230 - 240V (50/60Hz)

Q461
UN4215TA
MOTOR CONT.

IC11
LM2940T5M
REGULATOR

Q15, 16
2SD2037EFTA
REGULATOR

Q472
UN4212TA
SWITCHING (REMOTE)

Q473
2SA1309QRSTA
SWITCHING (REMOTE)

JK472 REMOTE

Q21
2SC3311QRSTA
REGULATOR

Q853 Q852 Q851
UN4112TA
MUTING CONT.

Q22
2SA1309QRSTA
REGULATOR

IC801
BA4558FTI
L.P. FILTER AMP

Q801,802
2SD1450RSTTA
MUTING

JK801 L ch R ch OUT

IC401
UPD78043B014
SYSTEM CONTROL & FL DRIVE

Q401~403
DTC143ESTP
SWITCHING

D410~413
MA165TA

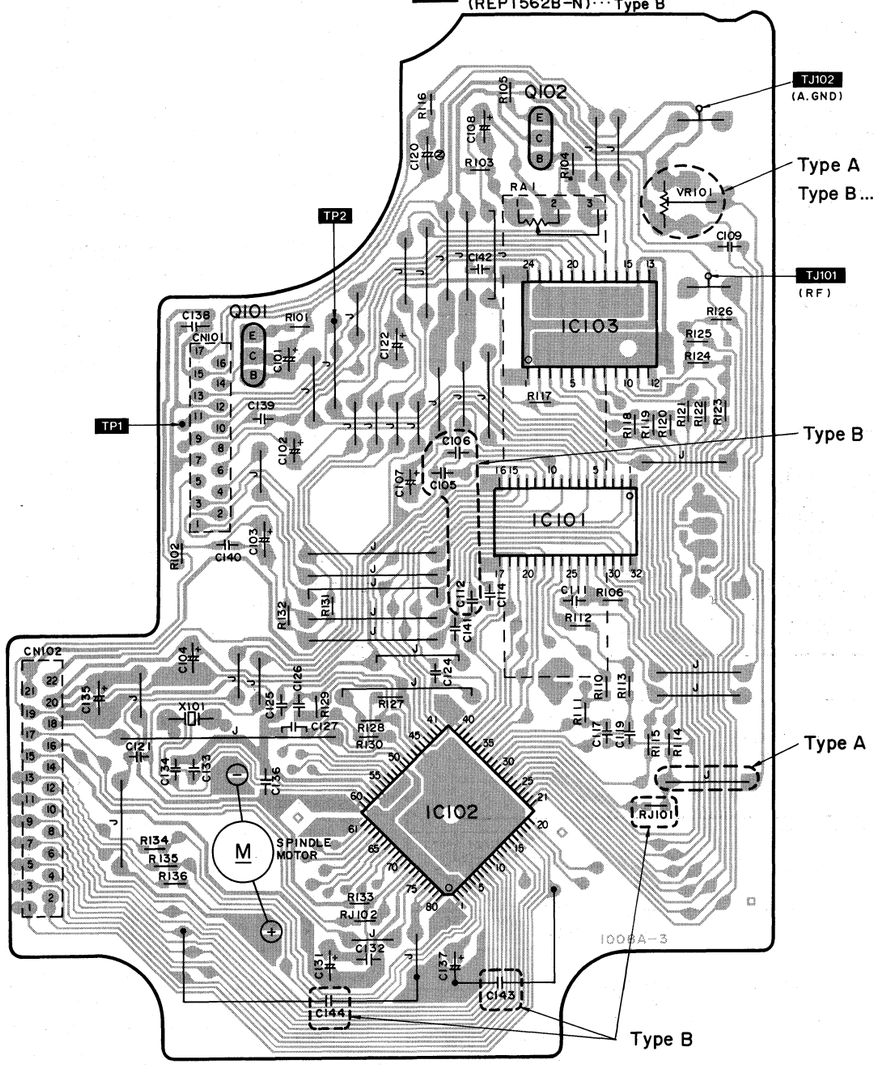
H POWER SUPPLY CIRCUIT For (GC) area.

CN701 PT701 S701 (VOLT ADJ.) 240V 220V 127V 110V L701 L702 JK701 AC 110/127/220/240V (50/60Hz)

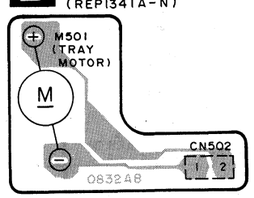
SL-PD647 SL-PD647

■ PRINTED CIRCUIT BOARDS

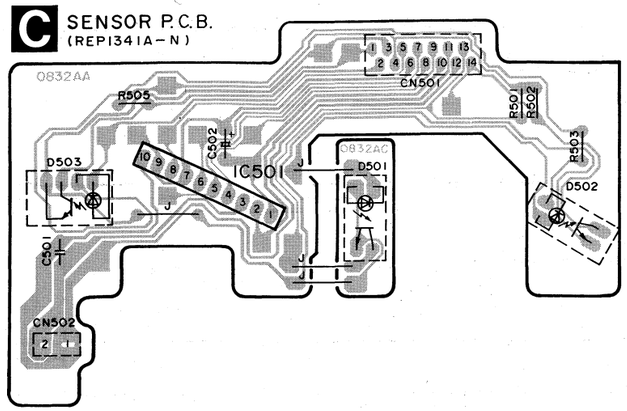
A SERVO P.C.B.
(REP1562A-N)··· Type A
(REP1562B-N)··· Type B



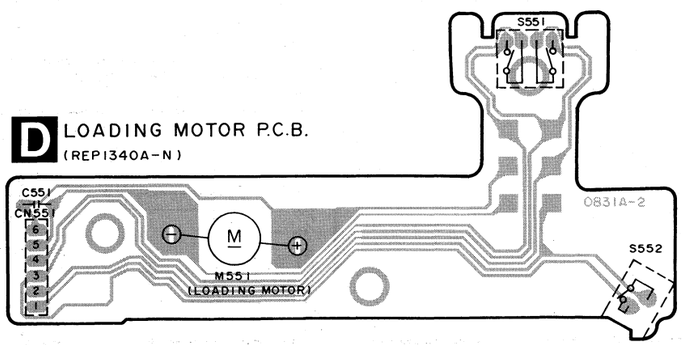
B TRAY MOTOR P.C.B.
(REP1341A-N)



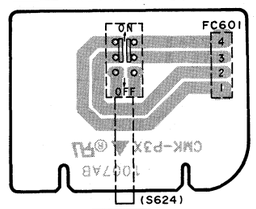
C SENSOR P.C.B.
(REP1341A-N)



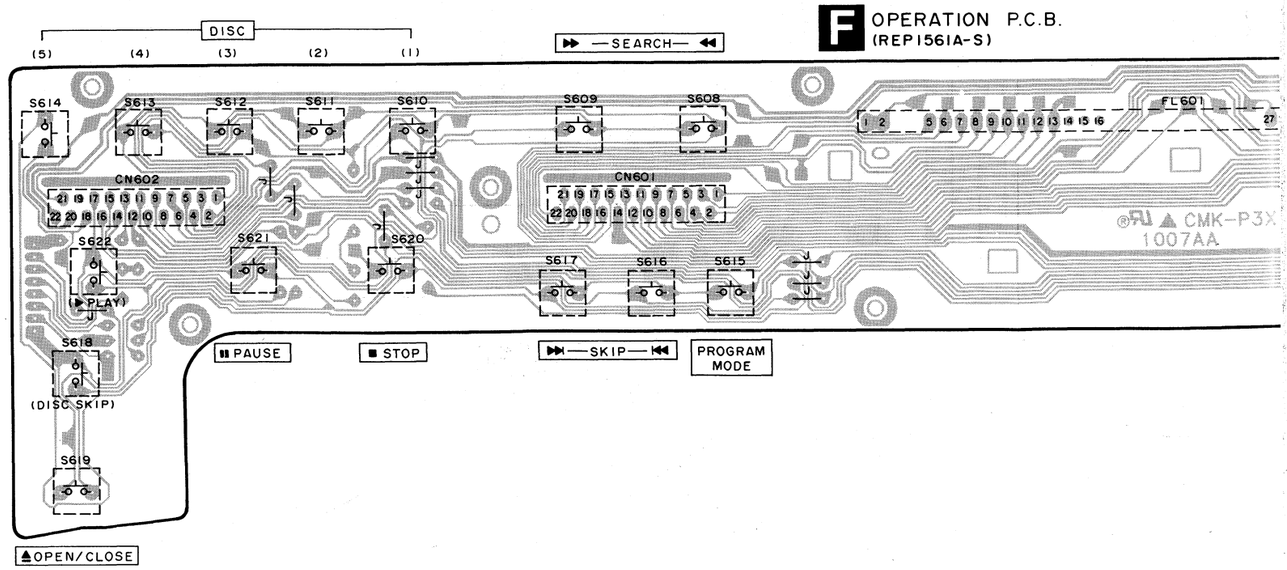
D LOADING MOTOR P.C.B.
(REP1340A-N)



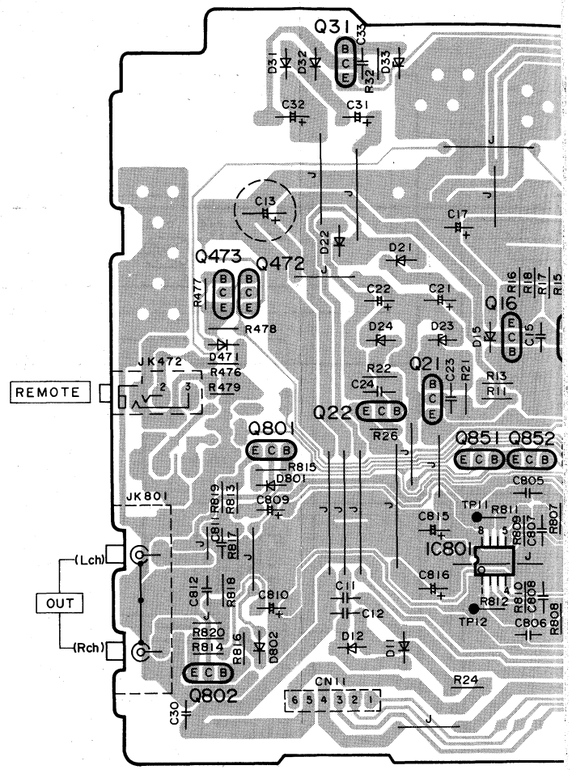
E POWER SWITCH P.C.B.
(REP1561A-S)



F OPERATION P.C.B.
(REP1561A-S)



G MAIN P.C.B. (REP1560B-M)



5 6 7 8 9 10 11 12 13 14

102
GND)

ype A

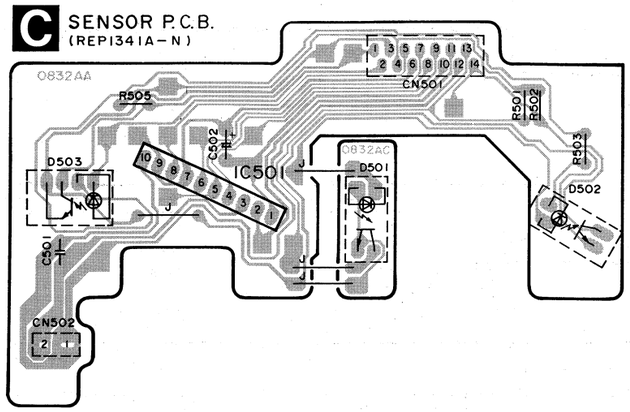
ype B..... VR101 is not installed on the P.C.B.
The foil pattern for VR101 is left open.

101
F)

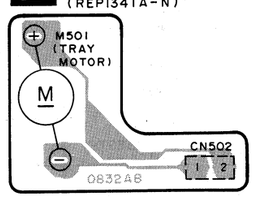
ype B

ype A

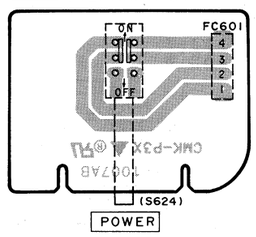
C SENSOR P.C.B. (REPI341A-N)



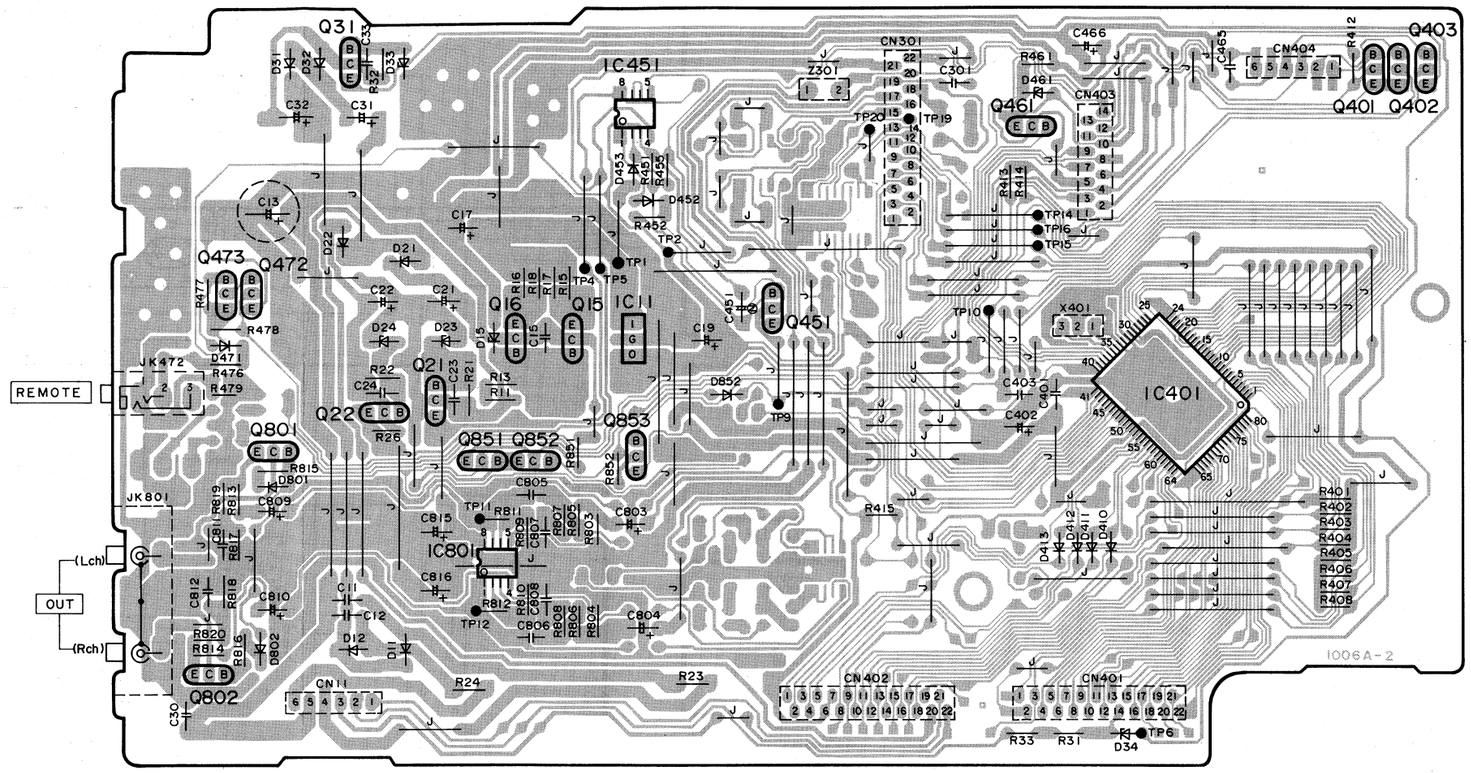
B TRAY MOTOR P.C.B. (REPI341A-N)



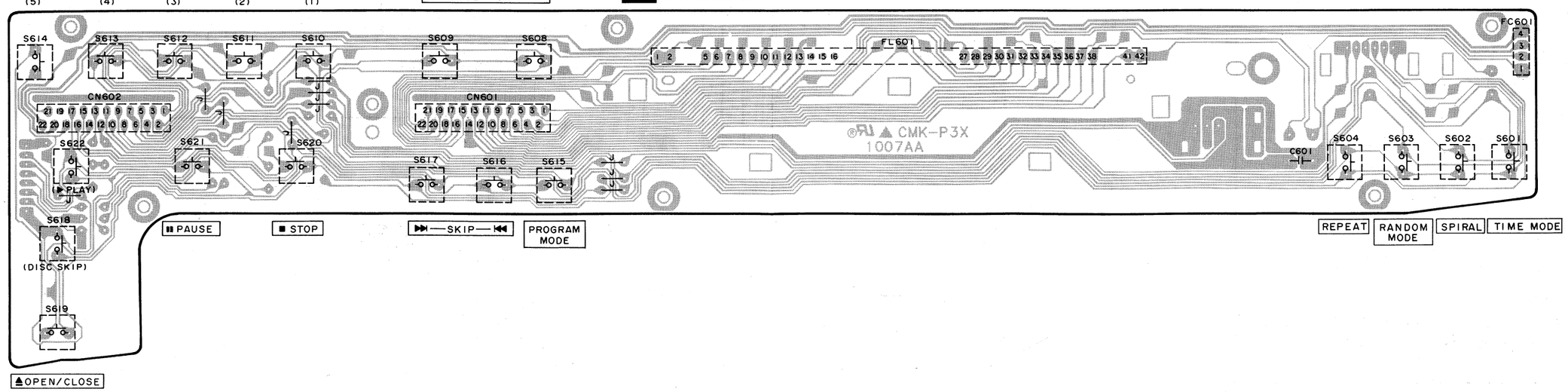
E POWER SWITCH P.C.B. (REPI561A-S)



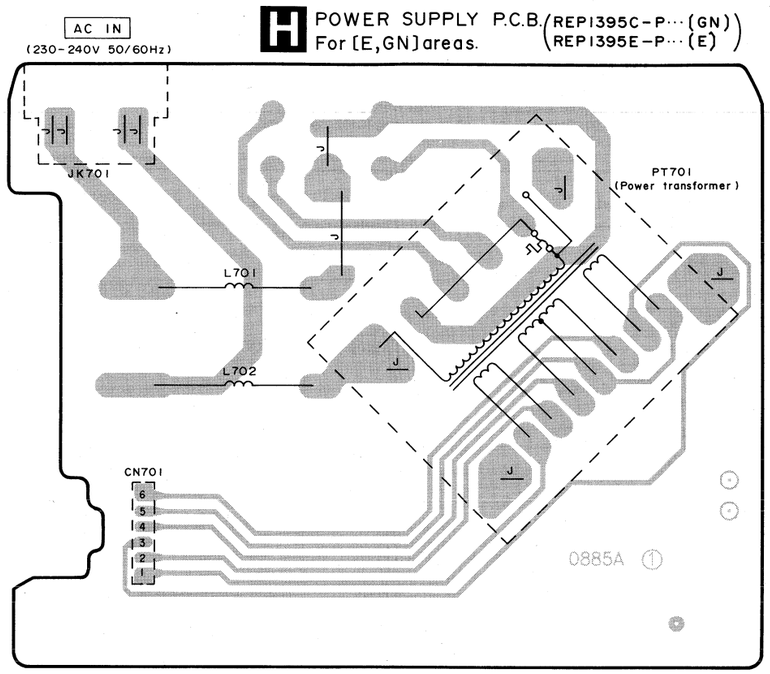
G MAIN P.C.B. (REPI560B-M)

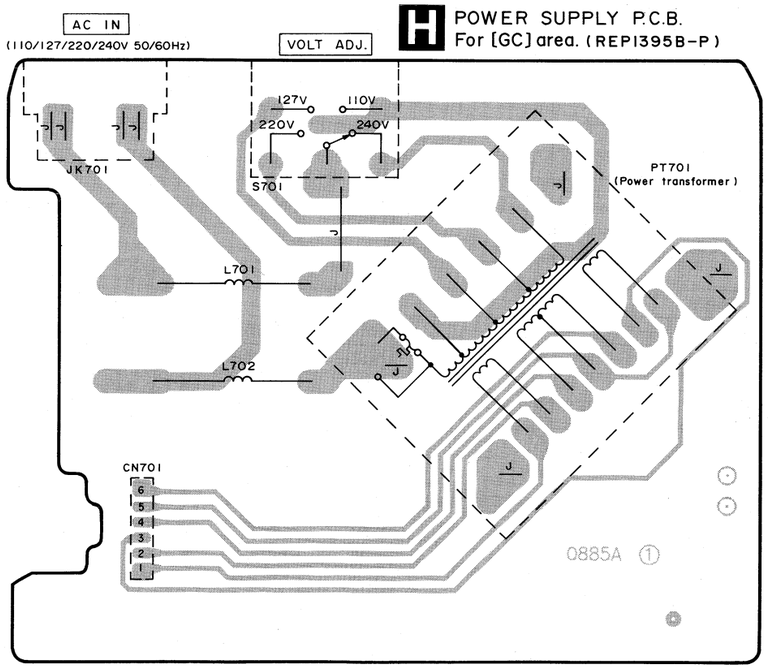


F OPERATION P.C.B. (REPI561A-S)

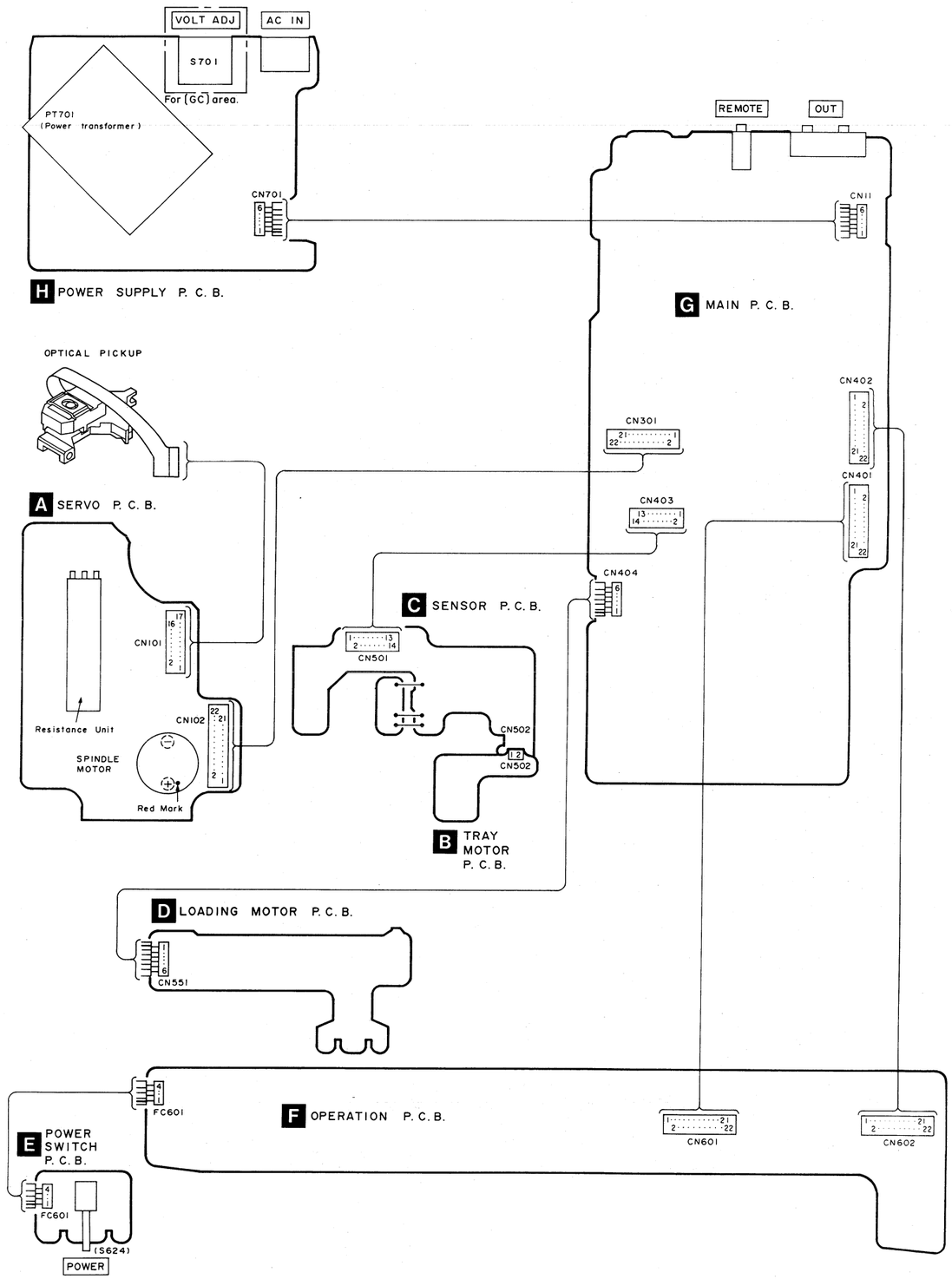


15 16 17 18 19



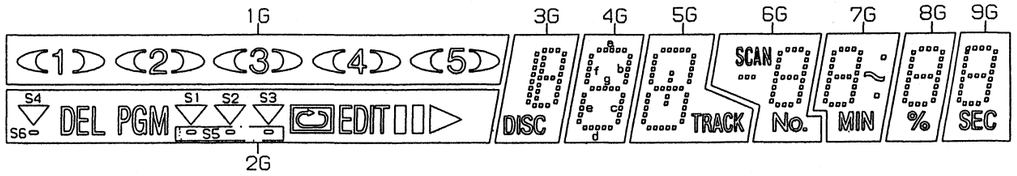


■ WIRING CONNECTION DIAGRAM



■ INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	1G	2G	3G	4G	5G	6G	7G	8G	9G
P 1	(1)	▷	a	a	a	a	a	a	a
P 2	(2)	▯▯	b	b	b	b	b	b	b
P 3	(3)	DEL	c	c	c	c	c	c	c
P 4	(4)	EDIT	d	d	d	d	d	d	d
P 5	(5)	▭	e	e	e	e	e	e	e
P 6	1	S3	f	f	f	f	f	f	f
P 7	2	S2	g	g	g	g	g	g	g
P 8	3	S1	DISC	–	TRACK	▫▫▫	MIN	%	SEC
P 9	4	PGM	⋮	–	⋮	No.	▫ (UPPER)	–	–
P10	5	S5	–	–	–	SCAN	~	–	–
P11	–	S4	–	–	–	–	▫ (LOWER)	–	–
P12	–	S6	–	–	–	–	–	–	–

• Pin connection

PIN NO.	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F1	F1	NP	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NC	NC	NC	G1	G2	G3	G4	G5	G6	G7	G8	G9	NP	NP	F2	F2

NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) NC ------ No connection
4) 1G~9G --- Grid

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Warning: This product uses a laser diode. Refer to caution statements on page 2.
*ACHTUNG: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.
*"Type A" marked parts are used for type A only, while "Type B" marked parts are for type B only.
Parts other than "Type A" and "Type B" marked are used for both types A and B.
*There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MW662712RA.
*The "(SF)" mark denotes the standard part.

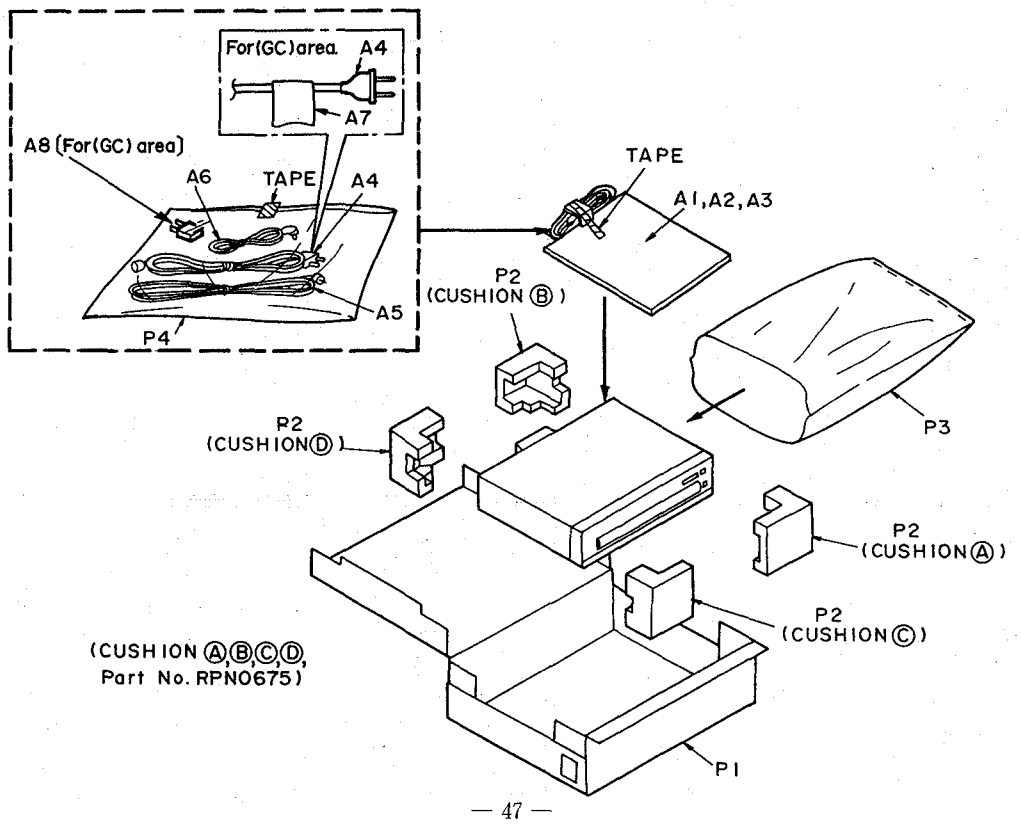
Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	LM2940T5	IC, REGULATER	⚠
IC101	AN8802SCE1V	IC, SERVO AMP	
IC102	MN662712RA	IC, SERVO PROCESSOR	See Notes.
IC103	AN8389SE1	IC, COIL/MOTOR DRIVE	
IC401	UPD78043B014	IC, SYSTEM CONTROL&FL DRIVE	
IC451	SVIBA4558F	IC, RESET SIGNAL GENERATOR	
IC501	BA6247N	IC, MOTOR DRIVE	
IC801	SVIBA4558F	IC, L. P. F.	
		TRANSISTOR(S)	
Q15, 16	2SD2037EFTA	TRANSISTOR	⚠
Q21	2SC3311A-Q	TRANSISTOR	⚠
Q22	2SA1309A-R	TRANSISTOR	⚠
Q31	2SB1238QSTV6	TRANSISTOR	⚠
Q101, 102	2SA1547QTV2	TRANSISTOR	
Q401-403	DTC143ESTP	TRANSISTOR	
Q451	UN4212TA	TRANSISTOR	
Q461	UN4215	TRANSISTOR	
Q472	UN4212TA	TRANSISTOR	
Q473	2SA1309A-R	TRANSISTOR	
Q801, 802	2SD1450RTA	TRANSISTOR	
Q851	UN4112	TRANSISTOR	
Q852	UN4212TA	TRANSISTOR	
Q853	UN4112	TRANSISTOR	
		DIODE(S)	
D11, 12	RL1N4003N02	DIODE	⚠
D15	MA4091-M	DIODE	⚠
D21, 22	RL1N4003N02	DIODE	⚠
D23, 24	MA4100MTA	DIODE	⚠
D31, 32	RL1N4003N02	DIODE	⚠
D33	MA4270	DIODE	⚠
D34	MA4082MTA	DIODE	⚠
D410-413	MA165	DIODE	
D452, 453	MA165	DIODE	
D461	MA4062MTA	DIODE	
D471	MA165	DIODE	
D501, 502	RSQGP1S53V	DIODE	
D503	RPR-363A	DIODE	
D801, 802	MA165	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D852	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR101	EVND3AA00B14	V. R, BEST EYE ADJUSTMENT	Type A
		TRANSFORMER(S)	
PT701	RTP1K4B012	POWER TRANSFORMER	(E, GN) ⚠
PT701	RTP1K4E020	POWER TRANSFORMER	(GC) ⚠
		COMPONENT COMBINATION(S)	
Z301	BL02RN2R62T4	COMBINATION PART	
		COIL(S)	
L701, 702	SLQX400-D	COIL	⚠
		OSCILLATOR(S)	
X101	RSXZ16M9M01T	OSCILLATOR(16. 9344MHz)	
X401	RSXY4M23M01T	OSCILLATOR(4. 2336MHz)	
		DISPLAY TUBE(S)	
FL601	RSL0145-F	DISPLAY TUBE	
		SWITCH(ES)	
S551	RSH2A001-2	SW, UP/DOWN DETECTOR	
S552	RSH1A017-U	SW, OPEN DETECTOR	
S601	EVQ21405R	SW, TIME MODE	
S602	EVQ21405R	SW, SPIRAL	
S603	EVQ21405R	SW, RANDOM	
S604	EVQ21405R	SW, REPEAT	
S608	EVQ21405R	SW, R. SEARCH	
S609	EVQ21405R	SW, F. SEARCH	
S610	EVQ21405R	SW, DISC 1	
S611	EVQ21405R	SW, DISC 2	
S612	EVQ21405R	SW, DISC 3	
S613	EVQ21405R	SW, DISC 4	
S614	EVQ21405R	SW, DISC 5	
S615	EVQ21405R	SW, PROGRAM	
S616	EVQ21405R	SW, R. SKIP	

Ref. No.	Part No.	Part Name & Description	Remarks
S617	EVQ21405R	SW, F. SKIP	
S618	EVQ21405R	SW, DISC SKIP	
S619	EVQ21405R	SW, OPEN/CLOSE	
S620	EVQ21405R	SW, STOP	
S621	EVQ21405R	SW, PAUSE	
S622	EVQ21405R	SW, PLAY	
S624	SSH1230	SW, POWER	⚠
S701	SSR187-1	SW, VOLTAGE ADJ.	(GC)⚠
		CONNECTOR(S) AND SOCKET(S)	
CN11	RJS1A6606	CONNECTOR(6P)	
CN101	RJS1A6717-1Q	CONNECTOR(17P)	
CN102	RJS1A6722-1Q	CONNECTOR(22P)	
CN301	RJS1A6822	CONNECTOR(22P)	
CN401, 402	RJS1A6822	CONNECTOR(22P)	
CN403	RJS1A6814	CONNECTOR(14P)	
CN404	RJS1A6606	CONNECTOR(6P)	
CN501	RJS1A6714	CONNECTOR(14P)	
CN502	RJR0094	SOCKET(2P)	
CN551	SJT30644-H	CONNECTOR(6P)	
CN601, 602	RJS1A6222	CONNECTOR(22P)	
CN701	SJT30643-V	CONNECTOR(6P)	
		FLAT CABLE(S)	
FC601	REZ0455-1	FLAT CABLE(4P)	
		JACK(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
JK472	RJJ33TR01	REMOTE CONTROL	
JK701	SJS9236	AC INLET	(E, GC)⚠
JK701	SJSD16	AC INLET	(GN)⚠
JK801	RJH3201N	LINE OUT	
		MAGNET RESISTOR ELEMENTS	
RA1	EWS7M0A00Q53	RESISTANS UNIT	
		PACKING MATERIAL	
P1	RPG1495	PACKING CASE	
P2	RPN0675	CUSHION	
P3	XZB60X65A01Z	PROTECTION BAG(UNIT)	
P4	XZB22X20C03	PROTECTION BAG(CORD)	
		ACCESSORIES	
A1	RQT1987-E	INSTRUCTION MANUAL	(E)
A1	RFKSLPD647GC	INSTRUCTION MANUAL ASS'Y	(GC)
A1	RQT1839-L	INSTRUCTION MANUAL	(GN)
A2	RQA0013	WARRANTY CARD	(E)
A2	RQX7433ZA	WARRANTY CARD	(GN)
A3	RQCB0169	SERVICENTER LIST	
A4	RJA0019-2K	AC POWER SUPPLY CORD	(E, GC)⚠(SF)
A4	SJA173	AC POWER SUPPLY CORD	(GN)⚠(SF)
A5	SJP2249-3	STEREO CONNECTION CABLE	
A6	SJP2257T	REMOTE CONTROL CABLE	
A7	RQLA0134	VOLTAGE CAUTION LABEL	(GC)
A8	SJP5213-2	POWER PLUG ADAPTOR	(GC)⚠

■ PACKAGING



■ REPLACEMENT PARTS LIST

Notes : * **Warning: This product uses a laser diode. Refer to caution statements on page 2.**

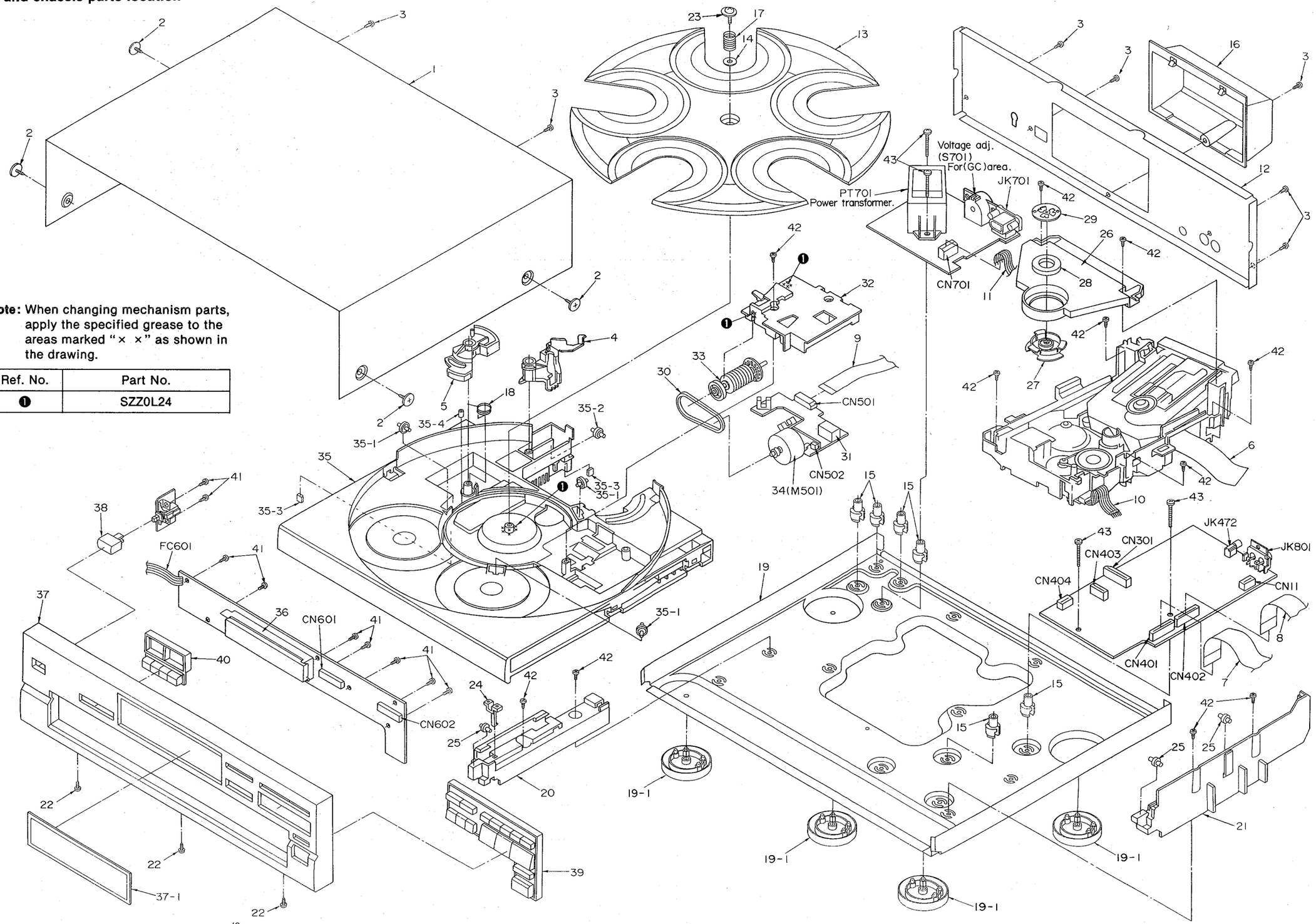
Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0193-K	CABINET	
2	SNE2129-3	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	RDG0239	OPEN LOCK GEAR	
5	RDG0199-2	CLOSE LOCK GEAR	
6	REZ0590	FPC BOARD(22P)	
7	REZ0474	FPC BOARD(22P)	
8	REZ0475	FPC BOARD(22P)	
9	REZ0476	FPC BOARD(14P)	
10	REZ0477	FLAT CABLE(6P)	
11	REZ0478	FLAT CABLE(6P)	
12	RFKHLPD647EK	REAR PANEL ASS'Y	(E)
12	RFKHLPD647GC	REAR PANEL ASS'Y	(GC)
12	RFKHLPD647GN	REAR PANEL ASS'Y	(GN)
13	RGT0007	ROTARY TRAY	
14	RHW81001-1	WASHER	
15	RKQ0089	P.C.B. SUPPORT	
16	RKQ0104	REAR COVER	
17	RMB0255	SPRING(DISC TRAY)	
18	RME0133-1	SPRING(LOCK GER)	
19	RFKJLPD627PK	CHASSIS ASS'Y	
19-1	RKA0053-A	FOOT	
20	RMR0540-K1	TRAY BASE GUIDE(L)	
21	RMR0593-K	TRAY BASE GUIDE(R)	
22	XTB3+8JFZ	SCREW	
23	XTWS3+10T	SCREW	
24	RMR0575-W	SLIDER(B)	
25	RMR0577-W	ROLLER	
26	RFKNLPD827GC	CLAMP PLATE ASS'Y	
27	SIRD51-1	CLAMPER	
28	SOMD4	MAGNET	
29	SOYD2	YOKE	
30	RDV0024	BELT	
31	RMN0174	SENSOR HOLDER	
32	RMR0547-K	WORM BASE	
33	RXG0026	WORM ASS'Y	
34	REM0026	TRAY MOTOR ASS'Y(M501)	
35	RXQ0289	TRAY ASS'Y	
35-1	RMR0546-K	TRAY ROLLER	
35-2	RMR0564-W2	ROLLER(A)	
35-3	RMG0269-H1	CUSHION RUBBER	
35-4	RMG0200	RUBBER	
36	RMN0172	FL HOLDER	
37	RFKGLPD647EK	FRONT PANEL ASS'Y	
37-1	RGK0470	FRONT ORNAMENT PLATE	
38	RGU0030	POWER BUTTON	
39	RGU0726	MAIN BUTTON	
40	RGU0727	SUB BUTTON	
41	XTB26+8J	SCREW	
42	XTB3+10JFZ	SCREW	
43	XTB3+20J	SCREW	
		LOADING MECHANISM	
101	SJED10	POTENTIOMETER HOLDER	
102	RME0115	SIDE PRESSURE SPRING	
103	RMQ0299	SCREW	
104	RMR0463	ROLLER	
105	SDOD28-2E	TURNTABLE	
105-1	XXE26D5	SCREW	
106	SDOD29-2	TURNTABLE RING	
107	SRQA010N04	TURNTABLE SPRING	
108	RXQ0232	SIDE PRESSSURE PULLEY	
109	SHRD176-E	BRUSH HOLDER	
110	SISD22-7	TRAVERSE BASE	
111	SJGDRF310T-2	SPINDLE MOTOR	
112	SNSD31	SCREW	
113	SUWD112-2	SHAFT HOLDER	
114	SUXD123-1	GUIDE SHAFT	
115	SOAD70A	OPTICAL PICKUP	
116	RFKNLPC363P	YOKE(A) ASS'Y	
117	SORD46-E	COIL ASS'Y	
118	SOYD22-1	YOKE(B)	
119	XTB3+10G	SCREW	
120	XTN2+5G	SCREW	
121	SHGD148	STOPPER RUBBER	
122	SHWD33	WASHER	
123	SHWD34	WASHER	
124	RDG0196-1	DRIVE GEAR(B)	
125	RDK0017	DRIVE CAM	
126	RDK0018	ELEVATION CAM	
127	RDP0050	PULLEY GEAR	
128	RXQ0252	LOADING MOTOR ASS'Y(M551)	
129	RXQ0302	MECHANISM BASE ASS'Y	
130	RXQ0251	SUB BASE ASS'Y	
131	RHD30029	SCREW	
132	RHD30030	SCREW	
133	RHD30031	SCREW	
134	RMA0581	REINFORCING PLATE	
135	RMG0268-K	BELT	
136	RDG0195	DRIVE GEAR(A)	
137	RMR0565-W3	SLIDER	
138	SHGD153-1	FLOATING RUBBER	
139	SUSD136-1	FLOATING SPRING(A)	
140	SUSD137-1	FLOATING SPRING(B)	
141	SUSD145-1	FLOATING SPRING(C)	
142	XTB3+10JFZ	SCREW	
143	RDG0194	REDUCTION GEAR	

■ EXPLODED VIEWS

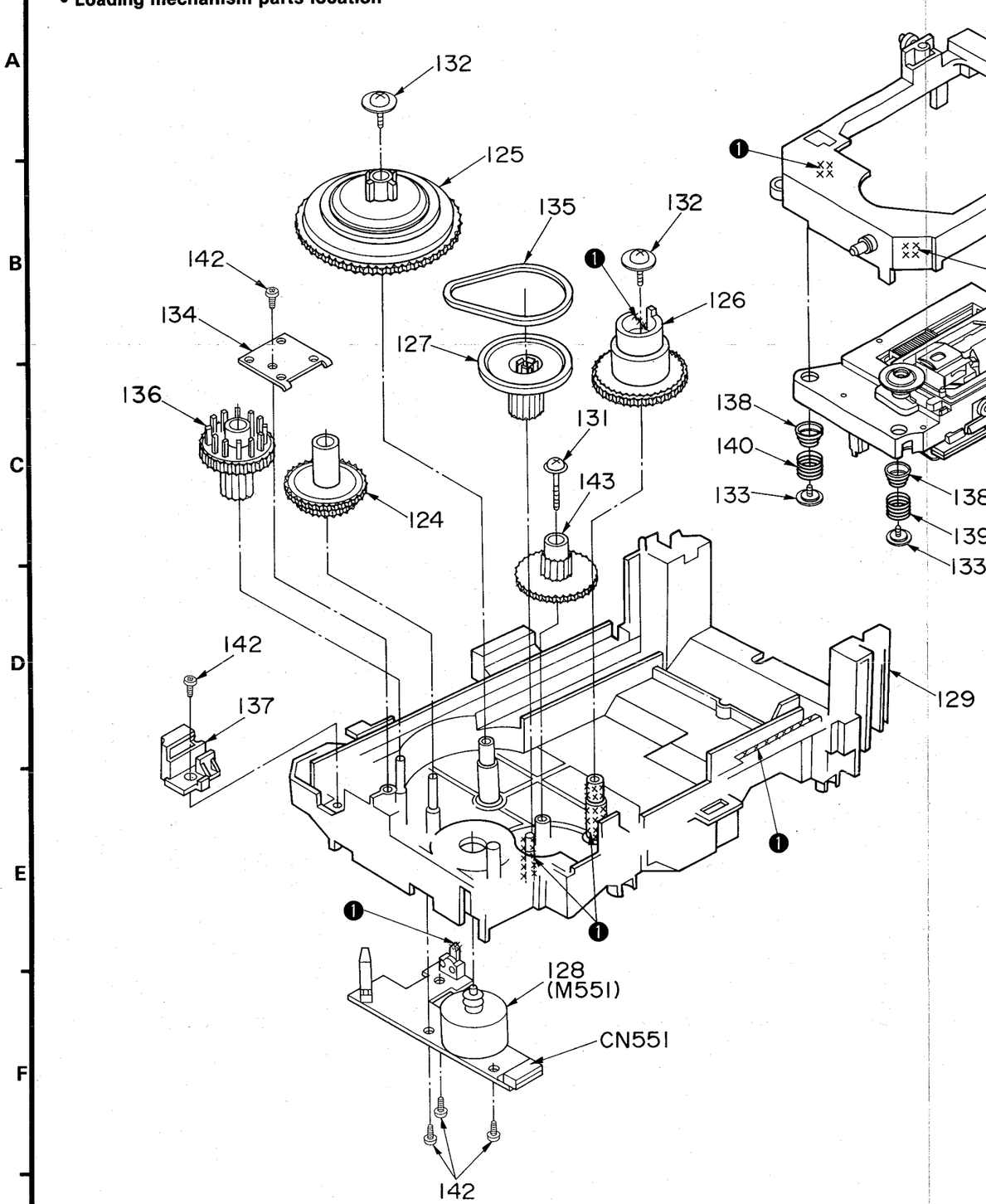
• Cabinet and chassis parts location

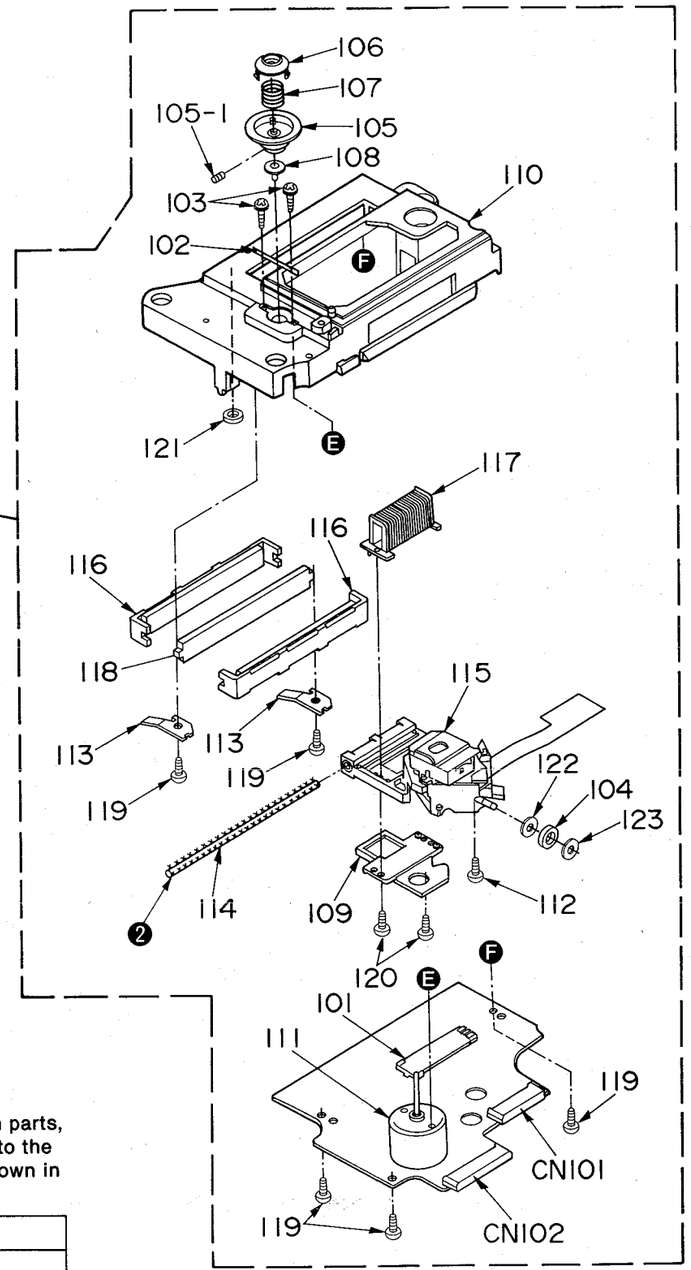
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❶	SZZ0L24



• **Loading mechanism parts location**





Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❶	SZZ0L24
❷	SZZ0L31

■ RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R11	ERDS2TJ271	1/4W 270
R13	ERDS2TJ271	1/4W 270
R15-18	ERDS2TJ1R0	1/4W 1.0
R21, 22	ERDS2TJ102	1/4W 1K
R23, 24	ERQ16NKWR15E	1W 0.15 ⚠
R26	ERDS2TJ102	1/4W 1K
R31	ERDS2TJ100	1/4W 10
R32	ERDS2TJ123	1/4W 12K
R33	ERDS2TJ120T	1/4W 12
R101	ERJ6GEYJ120V	1/10W 12
R102	ERJ6GEYJ471V	1/10W 470
R103	ERJ6GEYJ122V	1/10W 1.2K
R104	ERJ6GEYJ101V	1/10W 100
R105	ERJ6GEYJ472V	1/10W 4.7K
R106	ERJ6GEYJ471V	1/10W 470
R110	ERJ6GEYJ102V	1/10W 1K
R111	ERJ6GEYJ103V	1/10W 10K
R112	ERJ6GEYJ102V	1/10W 1K
R113	ERJ6GEYJ103V	1/10W 10K
R114	ERJ6GEYJ224V	1/10W 220K Type A
R114	ERJ6GEYJ104V	1/10W 100K Type B
R115	ERJ6GEYJ473V	1/10W 47K
R116	ERJ6GEYJ220	1/10W 22
R117	ERJ6GEYJ101V	1/10W 100
R118	ERJ6GEYJ392V	1/10W 3.9K
R119	ERJ6GEYJ103V	1/10W 10K
R120	ERJ6GEYJ473V	1/10W 47K
R121	ERJ6GEYJ472V	1/10W 4.7K
R122	ERJ6GEYJ473V	1/10W 47K
R123	ERJ6GEYJ682V	1/10W 6.8K
R125	ERJ6GEYJ393V	1/10W 39K
R126	ERJ6GEYJ822V	1/10W 8.2K
R127	ERJ8GEYJ154V	1/8W 150K
R128	ERJ6GEYJ683V	1/10W 68K
R129	ERJ6GEYJ155V	1/10W 1.5M
R130	ERJ6GEYJ221V	1/10W 220
R131, 132	ERJ6GEYJ682V	1/10W 6.8K
R133	ERJ6GEYJ101V	1/10W 100
R134-136	ERJ6GEYJ331V	1/10W 330 Type B
R401-408	ERDS2TJ472	1/4W 4.7K
R412-414	ERDS2TJ103	1/4W 10K
R415	ERDS2TJ473	1/4W 47K
R451	ERDS2TJ472	1/4W 4.7K
R452	ERDS2TJ101	1/4W 100
R455	ERDS2TJ821	1/4W 820
R461	ERDS2TJ391	1/4W 390
R476	ERDS2TJ272T	1/4W 2.7K
R477	ERDS2TJ562	1/4W 5.6K
R478	ERDS2TJ103	1/4W 10K
R479	ERDS2TJ100	1/4W 10
R501, 502	ERDS2TJ473	1/4W 47K
R503	ERDS2TJ271	1/4W 270
R505	ERDS2TJ203T	1/4W 20K
R803, 804	ERDS2TJ224T	1/4W 220K
R805, 806	ERDS2TJ822	1/4W 8.2K
R807, 808	ERDS2TJ153	1/4W 15K
R809-812	ERDS2TJ333	1/4W 33K
R813-816	ERDS2TJ102	1/4W 1K
R817, 818	ERDS2TJ473	1/4W 47K
R819, 820	ERDS2TJ100	1/4W 10
R851	ERDS2TJ222	1/4W 2.2K
R852	ERDS2TJ102	1/4W 1K
		CHIP JUMPERS
R124	ERJ6GEY0R00V	CHIP JUMPER
R134-136	ERJ6GEY0R00V	CHIP JUMPER Type A
RJ101	ERJ6GEY0R00V	CHIP JUMPER Type B
RJ102	ERJ6GEY0R00V	CHIP JUMPER
TJ101, 102	ERD25V0R00T	CHIP JUMPER
		CAPACITORS
C11, 12	ECBT1E103ZF	25V 0.01U
C13	ECEA1EU222B	25V 2200U ⚠
C15	ECBT1H102KB5	50V 1000P
C17	ECA1AM471B	10V 470U
C19	ECEA0JKA101B	6.3V 100U
C21	ECA1EM101B	25V 100U ⚠
C22	ECA1EM221B	25V 220U ⚠
C23, 24	ECBT1H102KB5	50V 1000P
C30	ECFR1E104ZF5	25V 0.1U
C31, 32	ECA1HM470B	50V 47U
C33	ECBT1H102KB5	50V 1000P
C101	ECEA0JKA220	6.3V 22U
C102	ECEA1HKS010	50V 1U
C103	ECEA0JKS470	6.3V 47U
C104	ECEA0JKS101I	6.3V 100U
C105	ECUV1E273KBN	25V 0.027U Type B
C106	ECUV1H101JCN	50V 100P Type B
C107	ECEA1HKS010	50V 1U
C108	ECEA0JKS470	6.3V 47U
C109	ECUV1C224KBM	16V 0.22U
C111	ECUV1H331KBN	50V 330P
C112	ECUV1E273KBN	25V 0.027U Type B
C114	ECUV1H471KBN	50V 470P
C117	ECUV1H122KBN	50V 1200P
C119	ECUV1H471KBN	50V 470P
C120	ECEA1CSN220I	16V 22U
C121	ECUV1C104ZFN	16V 0.1U
C122	ECEA1CKS470I	16V 47U
C124	ECUV1H561KBN	50V 560P
C125	ECUV1E103KBN	25V 0.01U
C126	ECUV1E822KBN	25V 8200P
C127	ECUV1C224KBM	16V 0.22U
C131	ECEA0JKS101I	6.3V 100U
C132	ECUV1C104ZFN	16V 0.1U
C133, 134	ECUV1H100DCN	50V 10P
C135	ECA0JKF101I	6.3V 100U
C136	ECUV1E104ZFM	25V 0.1U
C137	ECA0JKF101I	6.3V 100U
C138	ECUV1E104ZFM	25V 0.1U
C139	ECUV1E823KBN	25V 0.082U
C140-142	ECUV1C104ZFN	16V 0.1U
C143, 144	ECBT1H331KB5	50V 330P Type B
C301	ECBT1C103NS5	16V 0.01U
C401	ECBT1C103NS5	16V 0.01U
C402	ECEA0JKA101B	6.3V 100U
C403	ECFR1E104ZF5	25V 0.1U
C451	ECEA1HKN010B	50V 1U
C465	ECBT1C103NS5	16V 0.01U
C466	ECEA1AKA470B	10V 47U
C501	ECBT1C103NS5	16V 0.01U
C502	ECEA1AKA470E	10V 47U
C551	ECBT1C103NS5	16V 0.01U
C601	ECFR1E104ZF5	25V 0.1U
C803, 804	ECEA1CKA100B	16V 10U
C805, 806	ECCR1H391J5	50V 390P
C807, 808	ECCR1H331J5	50V 330P
C809, 810	ECEA0JKA220B	6.3V 22U
C811, 812	ECBT1H102KB5	50V 1000P
C815, 816	ECEA1AKA470B	10V 47U

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